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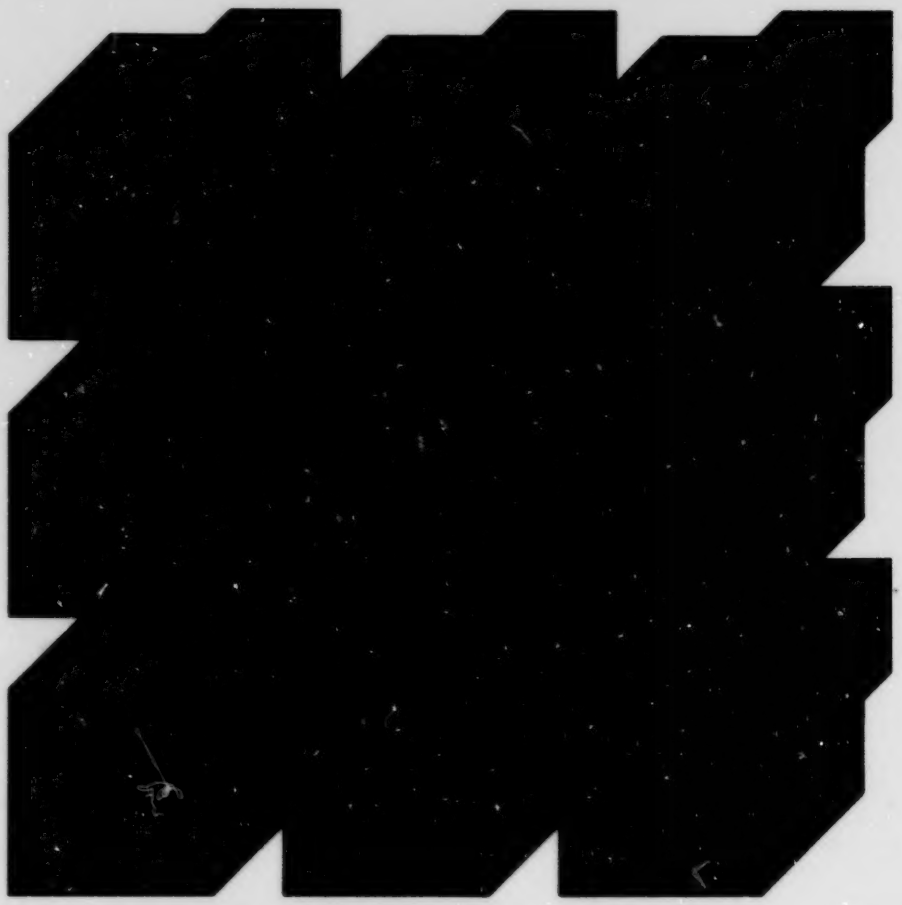

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DISCUSSION PAPER NO. 272

Grains in Western Canadian Economic Development to 1990

by R. M. A. Loyns and
Colin A. Carter

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RÉSUMÉ

LE RÔLE DES CÉRÉALES DANS LE DÉVELOPPEMENT ÉCONOMIQUE DE L'OUEST CANADIEN D'ICI 1990

L'objet du présent document consiste à analyser la place des céréales dans l'économie des Prairies et les forces qui influeront vraisemblablement sur la situation de l'industrie céréalière d'ici la fin de la décennie. La production de céréales dans les provinces des Prairies s'élève à plus de 7,0 milliards de dollars annuellement, ce qui correspond à deux fois la valeur de la production de bétail dans les Prairies et à plus de 85 % de la production céréalière totale du Canada. Dans le passé, les exportations de céréales ont été pour le Canada l'un des principaux moyens d'acquérir des devises étrangères.

L'auteur relève deux courants d'idée contradictoires au sujet des perspectives de l'industrie céréalière candienne : certains prétendent que la croissance de la population mondiale et l'amélioration des revenus assureront la prospérité aux producteurs de céréales dans les années à venir, alors que d'autres craignent que les coûts excessifs mènent inexorablement à la faillite les exploitants agricoles et l'agriculture canadienne en général. Ni l'une ni l'autre de ces propositions ne représente cependant un modèle plausible de la production céréalière des provinces des Prairies ou de son rôle dans le développement de ces provinces durant la prochaine décennie.

Des changements remarquables se sont produits dans la production céréalière des Prairies durant la décennie 1970. La production primaire a évolué considérablement ces dernières années et, en général, elle est progressive sur le plan technologique; les agriculteurs sont plus instruits, la production s'est accrue, et bien que les coûts et la dette aient augmenté rapidement dans bien des cas, les coefficients d'endettement n'ont pas été

sensiblement modifiés dans l'ensemble. De plus, le système de manutention et de transport est beaucoup mieux équipé aujourd'hui qu'il ne l'était dans les années 70. Les agriculteurs demeurent cependant à la merci des caprices de la température et des fluctuations des marchés mondiaux : les prix de leurs produits sont entièrement déterminés à l'extérieur du pays et certains éléments de la production dépendent de la température.

À l'échelle internationale, le taux de croissance du commerce des céréales observé au cours de la dernière décennie ne pourra probablement pas être maintenu, tandis que les prix réels des céréales vont sans doute continuer à diminuer graduellement. Contrairement aux sombres prédictions d'une population croissante exerçant des pressions sur les approvisionnements de vivres, les marchés de céréales subissent, et continueront vraisemblablement à subir les pressions d'une surabondance de l'offre. Comme résultat, il faut s'attendre à une continuelle diminution des prix réels. Pour que cette situation soit modifiée, il faudrait que d'importants changements soient apportés au commerce mondial des céréales, ou encore que l'un ou plusieurs des principaux pays producteurs de céréales connaissent des difficultés de production sérieuses et tenaces.

Comme conséquence, la première conclusion qui ressort de cette étude est que les céréales des Prairies continueront dans l'avenir à suivre un cours semblable à celui des dernières années : des prix réels à la baisse et un degré considérable de variabilité, tandis que le secteur agricole demeure exposé à de constantes pressions des coûts et des prix. Le plus important changement à survenir sera un ralentissement de la croissance du commerce des céréales.

Dans ces circonstances, les auteurs en viennent à la conclusion que la performance de l'économie du secteur céréalier des provinces des Prairies au cours de la prochaine décennie tiendra d'abord à la démarche qu'adoptera

l'industrie à l'échelle locale pour améliorer la productivité et l'efficacité. L'industrie céréalière des Prairies est très fortement réglementée. Les auteurs indiquent certains secteurs où des changements ou des adoucissements à la réglementation contribueraient à accroître la concurrence au sein de l'industrie, et à améliorer la productivité et l'efficacité. La recherche offre également des possibilités d'améliorer la performance. Le dossier de la recherche agricole sur les céréales est extrêmement favorable, et les taux de rendement de la recherche sont élevés. Par contre, les dépenses publiques réelles consacrées à la recherche diminuent, tandis que d'importantes lacunes subsistent. Quant au financement de la recherche provenant de sources privées, il a traditionnellement été faible, sauf dans des domaines très restreints. Ainsi, les fonds consacrés à la mise au point de nouvelles variétés de céréales sont plus contraignants aujourd'hui qu'il y a une décennie, bien que des fonds plus considérables seraient requis. De même, les auteurs notent une grave insuffisance de la recherche sur les sols et sur tous les aspects de la commercialisation de la production céréalière canadienne. Les auteurs concluent enfin qu'il faut davantage mettre l'accent sur l'ensemble des aspects commerciaux des céréales des Prairies. Il n'est pas certain que notre dépendance à l'égard des blés de haute qualité constitue la meilleure stratégie pour la prochaine décennie, alors que notre dépendance à l'égard des pays du bloc communiste comporte des risques évidents. La coopération entre exportateurs est essentielle au rétablissement d'échanges et de prix plus normaux sur les marchés céréaliers mondiaux.

SUMMARY

GRAINS IN WESTERN CANADIAN ECONOMIC DEVELOPMENT TO 1990

This study analyses the role of grains in the Prairie economy and the forces which are likely to influence the status of the grains industry over the remainder of this decade. Grains production on the Prairies represents over 7.0 billion dollars of farm production which is twice the value of livestock production on the Prairies and over 85 percent of total Canadian grains production. Over the years, exports of grain have been a major foreign exchange earner for Canada.

The study addresses basically two contradictory views that have come to characterize the prospects for Canadian grains: that world population growth and rising incomes will produce prosperous times for grain producers in the years ahead; and that excessive cost pressures are driving farmers and Canadian agriculture out of business. Neither of these propositions is considered to provide a plausible model for Prairie grains or their role in development during the next decade.

The decade of the 70's produced remarkable changes in Prairie grains production. Primary production has undergone major changes in recent years and, generally, is technologically progressive; farmers are better educated, production has increased, and although many costs and debt have increased rapidly, overall debt-equity ratios have not changed significantly. In addition, the handling and transportation system is far better equipped today to handle the volumes of production than it was in the 1970's. Farmers, however, remain victims of the vagueries of weather

and international markets; prices for their products are totally outside Canadian control, as are the elements of production dependent on weather.

On the international side, the growth rate of grain trade experienced over the past decade is not likely to continue while the gradual slide in real prices for grain likely will. Contrary to the dismal forecasts arising from increasing population pressure on food supplies, commercial grain markets have been, and are expected to continue to be, under pressure from supplies. The result will be continued declining real prices. A major change in the organization of the world grain trade, or prolonged production problems in one or two of the major grain producing countries would be required to change this situation.

As a consequence, the basic conclusion of this study is that Prairie grains will continue on a course similar to that which has been experienced --declining real prices, considerable variability, and the farm sector subject to continuous cost-price pressures. The most important difference will be the slow down of growth in trade in grains.

Under these conditions, it is concluded that the performance of the Prairie grains economy over the next decade will depend critically on the domestic approach to the industry in improving productivity and efficiency. Prairie grains are a very heavily regulated industry. The study indicates areas where changes in, or relaxation of, regulation would contribute toward increased competition within the industry, and towards improved productivity and efficiency. Research also has potential for improving upon performance. The record of agricultural research in grains has been extremely favorable, and rates of return to research are high. However, the real public expenditures on research are declining, and important gaps remain; private funding of research has traditionally been small except in very selective areas. For example, funds devoted to development of new

grain varieties are more constraining today than a decade ago at a time when the market signals indicate the need for more funds. Similarly, it is a conclusion of this study that research on the land resource and on all aspects of marketing Canadian grains is seriously lacking. Finally, the study concludes that greater emphasis is needed on the overall trade aspects of Prairie grains. It is unclear that our dependence on high quality wheats is the correct strategy for the next decade while our dependence on Communist-bloc countries appears to have inherent dangers. Exporter cooperation is essential to re-establish more normal trade flows and prices in international grain markets.

GRAINS IN WESTERN CANADIAN ECONOMIC DEVELOPMENT TO 1990

R.M.A. Loyns, Colin A. Carter

I. Introduction

The purpose of this study is to analyze the likely role of grains in the path of economic development of western Canada during the remainder of the 1980's. Grains are distinguished among other agricultural products because of their dependence upon the land resource and because of their historical role in dominating the prairie economy. Among the resource industries, agriculture and grain production are somewhat unique: the land base provides a continuous flow of production over time, and provided reasonable care is taken, this basic resource is fully and continuously renewable.

The image of the potential for agriculture and grains in western Canada is a series of contradictions. On the one side, Malthusian-type arguments point to the exponential growth in world population and limited global food supply potential, indicating the spectre of an increasingly hungry world. In addition, it is often argued that Third world development will result in ever increasing demand for grains as livestock feed to provide for the meat consumption that accompanies development. Domestically, the grain transportation system is being revamped to handle increasing volumes of grain shipments. These and other signals are held by many to indicate a very bright future for western Canadian grains and for western Canadians.

On the other hand, Canada has lost some of its traditional share of world grain trade and today is increasingly dependent on Communist Bloc countries for grain sales; importing countries, in particular the EEC and

Japan, have successfully kept downward pressure on exporter prices and volumes to the benefit of their own treasuries and producers. Domestically, costs continue to rise while real grain prices have fallen, and changes in grain transportation rates are reducing prices received by farmers for western Canadian grains. Finally, there are concerns that prairie soils are undergoing important forms of degradation. These factors and others suggest that the future of grains in western Canada will produce its share of economic and political issues. Some, if not all, of these contradictions will be played out as we move through the remainder of the 1980's. Throughout this study, we have attempted to produce evidence and economic analysis which provides a clearer picture of the probable path of development of grains to 1990.

At the outset, it is essential to identify what is meant by "grains" and to provide a sketch of the organization of the western Canadian grain industry. Grain is used throughout this study to mean cereals, oilseeds and specialty crops grown in western Canada for human and animal feed purposes and for industrial uses (Table 1). This classification system is tailored to western Canada in that it reflects the structure of production and marketing that is found there; in other regions, the classification of some crops would be different. For example, corn and soybeans could hardly be considered specialty crops in Ontario or the U.S. Mid-West, but they are relatively new and unimportant among the set provided, and are considered specialty crops in western Canada. Similarly, rapeseed and flax would be specialty crops in other areas, but in the Prairies they are relatively important from a production standpoint and occupy particular positions in the marketing institutional framework of the Prairies. The essential feature of all of these commodities is that they are all field crops grown on farmland in western Canada.

Table 1

Western Grains and Their Utilization

Group/Crop	Major Uses
1. Cereals	
wheat, spring	bread flour, livestock feed
wheat, durum	pastas, pastry flour
wheat, winter	bread flour, livestock feed
barley	livestock feed, malt, some gasohol
oats	livestock feed, breakfast products
rye	distilling, rye flour, livestock feed
2. Oilseeds	
rapeseed (canola)	vegetable and high quality industrial oils, meal for livestock
flaxseed	linseed oil, flax meal
3. Special Crops	
corn	livestock feed, distilling, cooking oil and corn products, gasohol
soybeans	vegetable oils, meal for livestock, food extenders
mustard	condiment
peas	protein starch and fibre, soups, some livestock feed
lentils	soups, food extenders
sunflower seed	vegetable oil, meal, confections
canary seed	birdseed
forage and grass seed	forage crops, pastures and lawns, crop rotations

Another way of viewing the farm commodities in Table 1 is to consider their positions in the marketing environment. In general, wheat, oats and barley for export and for domestic human consumption are (price and delivery) controlled by the Canadian Wheat Board (CWB). As a result, they are usually referred to as "Board" grains. Rapeseed, flaxseed and rye, as well as wheat, oats and barley for domestic feed are also partly controlled (delivery quotas) by the CWB and are usually referred to as "Off-Board" or "Open Market" grains. An indication of the relative importance of these crops is presented in Table 2, where the value of crop and livestock production is reported by province.

The history of development of the Canadian grains industry is an important component of understanding what exists today, and provides some indication of the path of probable future development. While it was not part of the scope of this study to review the important historical developments, the authors do urge readers to view this report in the context of the grain industry's evolution. Several publications are available which provide this perspective. Two recent publications which might be consulted are Carter[1] and the Canadian International Grains Institute.[2] The former is a very brief review of the subject while the latter book is a long and detailed review.

Table 2

Value of Production of Principal Crops and Livestock in the western Provinces, 1981 and 10 year average

	Manitoba		Saskatchewan		Alberta		B.C.	
	1981	10 yr[1] av.	1981	10 yr[1] av.	1981	10 yr[1] av.	1981	10 yr[1] av.
	.....			$000,000				
All Wheat	598.8	323.6	2,688.0	1,673.3	1,149.8	595.7	15.8	11.3
Oats	47.1	56.4	87.5	90.0	128.8	118.3	5.3	4.9
Barley	298.5	162.5	439.1	309.0	864.0	518.9	21.0	14.8
Rye	25.6	9.4	47.8	20.7	45.7	21.3	1.0	0.6
Flax	83.7	68.7	46.8	51.6	17.1	19.3	--	--
Rapeseed	85.7	78.4	212.5	215.7	209.7	211.9	6.3	10.5
Corn	45.7	12.6	--	--	5.0	3.1[2]	--	--
Sunflowers	42.0	21.1	1.5	0.7	--	--	--	--
Other[3]	36.4	16.1	22.5	12.7	10.2	7.4	--	--
TOTAL CROPS	1,263.5	748.8	3,545.7	2,373.9	2,430.3	1,495.9	49.4	42.1
Livestock	621.7	--	647.6	--	1,704.7	--	524.2	--

[1]Ten-year average, 1971/81.

[2]Three year average, 1979/83.

[3]Includes: Buckwheat, Dry Peas, Mustard Seed.

Sources: Canada Grains Council, Statistical Handbook '82.
Statistics Canada, Quarterly Bulletin of Agricultural Statistics, Catalogue No. 21-003, 1971/81.

Approach and Outline of the Report

Certainly there are a number of alternative approaches which could be taken in analyzing the future role of the grain industry. One general approach would be a highly quantitative effort in econometric modelling, forecasting domestic economic activity (including grains), and linking the domestic results with quantitative models of the world market for grains. Another quantitative approach would be to simulate various scenarios of domestic and international outcomes within an input-output framework to trace provincial and national impacts. These or other quantitative analyses would, however, require resources considerably beyond those available to our study.

Our methodology was a more modest effort reflecting the limited availability of resources and particular expertise of the analysts. As a consequence, for the quantitative estimates the approach has been to review recent literature on the domestic and international side of the Canadian grains industry, and to synthesize from the literature a probable path of development. In conducting our analysis we have attempted to identify the major issues affecting the Prairie grains economy, and to identify the effects of the various facilitators and constraints that will condition change in grains in the remainder of this decade. The specific objectives of the study were:

1. to identify the role of grains in the economies of Canada and the western Provinces;

2. to identify the significant features of the resource base for grains production in relation to the next decade;

3. to review the domestic and international market environment for Canadian grains in the remainder of the 1980's;

4. to analyze the institutional, political and regulatory framework and its relationship to the role of grains in development; and

5. to identify the probable path of development of grains to 1990, and the forces influencing that development.

Readers of this report will note that we make little reference to the important global issues of hunger, malnutrition and adequate food supplies for a hungry world. There are a number of reasons for this omission. The major reason is the time frame for our study--the remainder of the 1980's. Within that time frame, the press of population on food supplies under normal climatic conditions is not likely to change. This implies that production and consumption will be in reasonable balance at more or less steady or declining real prices. In fact, we argue throughout this study that real prices are likely to continue to decline. Therefore, it is likely that the world food problem for the medium term will remain, as it has been for decades, a distributional problem and not an adequacy problem in the global sense. The second reason for omitting this issue is, perhaps, symptomatic of the distributional problem--Canada deals in commercial grain markets and will likely continue to do so; the fact that food shortages exist for some of the world's population does not really influence Canadian grain trade. Food aid shipments from Canada in the form of cereal grains were about one million tonnes (grain equivalents) in 1976, and have declined in each of the succeeding five years, so that shipments in 1981 amounted to only 600,000 tonnes. Food aid activities of this magnitude have a negligible impact on our commercial transactions and are unlikely to have any influence on production or marketing variables within Canada. Consequently, the discussion is focussed on those grain markets which determine conditions for Canada and the grain industry in the Prairies, commercial grain markets.

The outline of this report is as follows: the next section provides a descriptive analysis of the role and magnitude of the western grain

industry in the Prairie and national economy. The third section discusses the resource base and inputs used in grains production. The fourth section discusses in detail the institutional and regulatory framework of the Prairie grain industry, and provides an indication of some of the major political forces that influence it. The subsequent section reviews recent studies of world supply and demand projections, and some of the domestic implications of these. Finally, the summary and conclusions section attempts to bring all the preceding discussion together in indicating the probable path of development of western grains in the context of the domestic and international environment for grains.

FOOTNOTES

[1]Colin A. Carter, The System of Marketing Grain in Canada. (Winnipeg: Extension Bulletin 82-2, Department of Agricultural Economics, University of Manitoba), 1983.

[2]Canadian International Grains Institute. Grains and Oilseeds: Handling, Marketing, Processing, (Winnipeg: Canadian International Grains Institute), 1982.

II. THE ROLE OF GRAINS IN THE WESTERN PROVINCES

As the era of the fur trade gave way to agricultural production during the mid 1800's in western Canada, grains, primarily wheat, became the vehicle of economic development. Railway construction, land settlement policy, immigration, trade and tariffs were all geared to opening up the untapped potential for grain production on the Prairies, and creating a domestic market for manufactured goods from eastern Canada. For decades wheat was King on the Prairies and it occupied a position of prominence in politics, trade policy and the Canadian image.[1]

Since the Great Depression, wheat has lost some of its stature within agriculture, and other grains have grown in importance. In addition, other sectors in the west have outgrown grains so that wheat and grains no longer possess their historical stature in economic and political terms. They are, however, still important.

The objective of this section is to identify the sizeand natureof recent developments in the western grains, oilseeds and special crops sector. The characteristics of the grains sector will be compared to those of western Canadian agriculture, to livestock, to Canadian agriculture generally, and to the Canadian economy as a whole.

Although the focus of this study is western Canada, the discussion will usually exclude British Columbia. While B.C. livestock are a significant source of demand for Prairie feed, and the two major ports on the Pacific Coast (Vancouver and Prince Rupert) handle a large and increasing share of Canadian grain exports,[2] British Columbia produces a very small amount of grain, mostly feed grains, and is not likely to

significantly increase its production. As a consequence, in the discussion which follows, B.C. data will not generally be presented, and the essential data and discussion of the grain industry will relate to the three Prairie provinces.

Prairie Grain Production

Table 2 in the previous section and Table 3 provide value and volume measures of grain production in 1981 and their averages for the preceding decade.

Wheat is the largest single crop by volume and value in Saskatchewan and Manitoba, but barley volume usually exceeds wheat volume in Alberta. Barley is the second largest crop in Manitoba and Saskatchewan with rapeseed (canola) a distant third in each province. Manitoba is the most diversified in its production of crops, with corn and soybeans beginning to appear in southern Manitoba. The value of livestock production in Manitoba is about the same as in Saskatchewan, but proportionately more important in Manitoba. Alberta is the most diversified in terms of crops and livestock, with livestock value approaching the combined value of wheat and barley production. Saskatchewan is by far the most specialized province with the specialization being, as it has been over the decades, in the production of Canada's traditional high quality wheat. Livestock (primarily cattle) production is large in Saskatchewan, but is overshadowed by grains production.[3]

The overriding factors which determine these important differences between the three Prairie provinces have been climatic conditions and soil types. In general, Saskatchewan has a huge dryland base upon which to produce high quality wheat with less risk and more returns than alternative crops. Climate and topography in Alberta favor livestock and barley

Table 3

Volume of Production of Principal Crops
on the Prairies,
1981, 10 year average

	Manitoba		Saskatchewan		Alberta	
	1981	10 yr.[1] av.	1981	10 yr.[1] av.	1981	10 yr.[1] av.
	'000 tonnes					
All Wheat	3,326	2,336	14,288	11,450	6,221	4,103
Oats	463	677	817	1,086	1,249	1,282
Barley	2,330	1,644	3,331	3,085	6,967	5,182
Rye	175	82	330	183	320	187
Flax	262	245	150	186	56	67
Rapeseed	306	298	748	818	760	803
Corn	432	110	--	--	30	6[2]
Sunflowers	171	91	4	4	--	0
Forage Seed	9	7	5	4	11	13
Other[3]	142	78	68	59	29	30
TOTAL	7,616	5,568	19,741	16,875	15,643	11,774

[1]Ten-year average, 1971-1981.

[2]Three-year average, 1979-1981.

[3]Includes: Buckwheat, Dry Peas, Mustard Seed.

Source: Canada Grains Council, Statistical Handbook '82.

production, and hence, the greater significance of barley. Manitoba, with its diversity of soil types and climate, can support more diversified crops as indicated by the increase in acreage of sunflowers in the 1970's and corn in the early 1980's.

Another significant factor in determining crops and cropping patterns in the prairies has been the regulatory framework. As discussed later, Canada has established and maintained a reputation for high quality wheat. Varieties development, quotas, and government priorities have concentrated over the years on high quality wheat. Consequently, wheat and the province of Saskatchewan have been in a favoured position. Manitoba farmers, because they could diversify, and because they have somewhat more direct access to U.S. and European outlets for special crops, responded by producing sunflowers, mustard, canary seed, and now corn and some soybeans.

These data indicate that crop production on the Prairies has been increasing, but the provincial differences in growth are considerable. Alberta has had the greatest growth during the 1971/81 period and it has been sustained; the index of production for crops in Alberta indicate a doubling of real production value between 1971 and 1981, with a large component of the increase coming in (winter) wheat. Manitoba production has increased 50 percent since 1971 but has been more variable than Alberta's. During this period, Manitoba reduced its summerfallow acreage to half the pre-1970 level (under 600 thousand hectares in 1982), which represents about 14 percent of Manitoba's cropped land. Alberta reduced its summerfallow by about 25 percent in the decade up to 1981, but summerfallow still represents about 26 percent of Alberta cropped land.

Saskatchewan's crop production in absolute terms grew about the same amount as Manitoba's, but due to the much larger land and production base, the growth rate was small (total growth in the value of real production of only 22 percent between 1971 and 1981). Saskatchewan production has continued to vary between years in response to climatic and market conditions, and while Manitoba and Alberta have reduced summerfallow substantially, Saskatchewan has maintained a reasonably constant and high proportion of its crop land in summerfallow (over 35 percent). To place the significance of **Saskatchewan summerfallow** in perspective, consider that it exceeds **total cropped acreage** in Manitoba by 2.0 M hectares, and is within 2.0 M hectares of Alberta's cropland; alternatively, it represented **over 20 percent of the total cropped land in Canada in 1982.** These comparisons illustrate that the three Prairie provinces are very different in their basic resources and production characteristics. **The Prairie region is anything but a homogeneous production unit.**

Tables 4 and 5 place prairie grain production in the context of crops and livestock production across Canada. Clearly, grains production in Canada is Prairie dominated except for corn and soybeans production in Ontario. However, the relatively rapid increase in feed grain production in eastern Canada in the past few years has slightly reduced the dominance of the west. Table 5 indicates that the west has slipped relative to eastern Canada in both grains and livestock production. It also indicates that the dominance of grains and livestock are approximately reversed in the east and west; overall in Canada, the total value of grains and livestock production at the farm level are about equal, but the **grains tend to be located in the west and livestock in the east.** This generalized locational difference has some important economic implications.

Table 4

Volume of Production of Principal Crops
Prairies and Canada
1981, 10 year average

	Prairies		Canada		Prairies as % of Canada	
	1981	10 yr.[1] av.	1981	10 yr.[1] av.	1981	10 yr.[1] av.
	.....'000 tonnes.....					
All Wheat	23,835	17,889	24,802	18,680	96.1	95.7
Oats	2,529	3,146	3,188	4,014	79.3	78.4
Barley	12,628	9,911	13,724	10,594	92.0	93.6
Rye	825	452	927	512	89.0	88.3
Flax	468	499	468	499	100.0	100.0
Rapeseed	1,780	1,899	1,837	1,958	96.9	97.0
Corn	462	116	6,743	4,086	6.9	2.8
Sunflowers	175	95	175	95	100.0	100.0
Forage Seed	25	23	31	31	80.6	74.2
Other[2]	239	167	246	178	97.2	93.8
TOTAL	43,000	34,213	52,141	40,647	82.5	84.2

[1]Ten-year average, 1972/81.

[2]Includes: Buckwheat, Dry Peas, and Mustard Seed.

Source: Canada Grains Council, Statistical Handbook '82.

Table 5

Value of Production of Principal Crops and Livestock on the Prairies and Canada, 1981, 10 year average

	Prairies		Canada		Prairies as % of Canada	
	1981	10 yr.[1] av.	1981	10 yr.[1] av.	1981	10 yr.[1] av.
	.....$000,000.....					
All Wheat	4,440.3	2,593.0	4,593.1	2,700.5	96.7	96.0
Oats	263.4	264.7	355.6	352.7	74.1	75.0
Barley	1,601.6	990.4	1,746.0	1,062.6	91.7	93.2
Rye	119.1	51.4	133.3	58.0	89.3	88.6
Flax	147.6	139.6	147.6	139.6	100.0	100.0
Rapeseed	507.9	506.5	514.2	516.5	98.8	98.1
Corn[2]	50.7	15.7	885.4	474.6	5.7	3.3
Sunflowers	43.5	21.8	43.5	21.8	100.0	100.0
Other[3]	69.1	36.4	71.4	38.1	96.8	95.5
TOTAL	7,239.5	4,618.6	8,490.1	5,364.4	85.3	86.1
Livestock	2,969.0	2,073.4	8,964.0	5,853.6	33.1	35.4

[1]Ten-year average, 1972/81.

[2]Ten-year average for Manitoba crop production. Three year average, 1979-1981 for Alberta corn production.

[3]Includes Buckwheat, Dry Peas, Mustard Seed.

Sources: Canada Grains Council, Statistical Handbook'82.
Statistics Canada, Quarterly Bulletin of Agricultural Statistics, Cat. No. 21-203, 1971/81.

Since grains tend to be exported (from the production region or from Canada) in a raw form, the associated economic activity or multipliers tend to be concentrated at the input end of grains production, but contributions of grains to Canada's balance of payments is significant (Table 6). On the other hand, livestock product exports are much less important than grains, but the distributing and processing of livestock create considerable value-added in post farm-gate industries in Canada. Since the producers of many farm inputs, and the inputs for grain production are located outside the Prairies, and there is a larger share of the livestock industry in Ontario and Quebec, the Prairie region likely experiences a less than proportionate share of economic activity derived from its grains production.

Farm Cash Income

Tables 7a to 7e summarize the last 20 years of cash income (receipts) to western Canadian and Canadian farms. These data provide considerable detail on the source of income, particularly in grains, but the expenditure components are not given since disaggregated data by commodity or farm type are not available. Farm cash income for "Wheat, Oats, and Barley" are combinations of the initial payments made by the CWB within the year of sale, and revenue from sales other than to the CWB. "CWB Payments" are final payments made by the CWB in a subsequent year to raise producer prices from the initial price to the final price received for the grain.

Using the data in Table 7e (Canada) for discussion purposes, it is apparent that the income flow to farmers associated with grain is a complex of CWB payments, stabilization payments (offset by levies), crop insurance, deferred and advance payments. There are several policies and programs associated with grain sales at the farm level in western Canada.

Table 6

Exports of Principal Grains and Oilseeds,
Unprocessed and Processed, 1982

	Unprocessed	Processed	Total	Unprocessed Total
	.....$000,000.....			.....%....
Wheat	4,286.7	75.3	4,362.0	98.3
Oats	18.9	n/a	18.9	n/a
Barley	886.3	131.8	1,018.1	87.1
Flax	136.9	2.0	138.9	98.6
Rapeseed	419.3	30.3	449.6	93.3
Other Cereal	215.6	245.4	461.0	46.8
TOTAL	5,963.7	484.4	6,448.5	92.5

Source: Statistics Canada, Exports, Catalogue No. 65-202, 1982.

Table 7a

Farm Cash Income by Source, Manitoba
1961-82

Source	1961/70 Av.	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1971/80 Av.
	millions of dollars													
Wheat	75.4	68.2	99.3	86.9	170.5	201.5	205.5	172.8	223.4	241.1	341.0	337.9	467.0	181.0
Wheat, CWB Payments	19.7	8.9	14.0	34.1	54.8	85.9	37.7	9.8	10.8	40.2	43.0	130.7	46.6	33.9
Oats	8.8	6.8	10.1	9.8	14.6	18.0	20.2	17.3	14.0	6.2	4.6	7.0	7.7	12.2
Oats, CWB Payments	2.3	.9	1.5	5.9	--	10.9	3.7	4.8	1.7	--	.3	--	.1	3.0
Barley	11.5	29.8	44.5	48.4	79.6	69.3	72.0	57.9	82.9	93.5	84.2	127.7	148.0	66.2
Barley, CWB Payments	2.0	2.2	.8	21.5	21.3	29.7	8.4	13.0	16.4	9.5	9.3	20.3	15.2	13.2
Western Grain Stabilization Payments	--	--	--	--	--	--	--	--	18.4	41.4	--	--	--	6.0
Crop Insurance Payments	--	1.0	2.5	1.6	3.5	10.5	9.9	6.5	6.0	11.2	55.3	18.3	19.8	10.8
CWB Net Cash Advance Payments	0.8	-9.0	-5.8	2.2	1.7	-3.4	4.7	12.4	-.4	-10.9	-5.1	29.9	0.2	-1.4
Deferred Grain Receipts	--	--	--	-42.5	-69.1	-61.3	-50.8	-33.5	-34.8	-45.2	-58.1	-68.9	-65.4	-39.5
Liquidation of Deferred Grain Receipts	--	--	--	--	42.5	69.1	61.3	50.8	33.5	34.8	45.2	58.1	68.9	33.7
Rye	1.8	2.0	2.3	3.1	4.1	5.3	6.3	4.9	4.8	7.2	17.1	16.5	13.6	5.7
Flaxseed	21.8	14.7	13.0	38.5	61.3	38.1	39.9	42.1	54.6	77.2	92.9	71.4	59.3	47.2
Canola	3.5	14.1	19.9	32.5	50.1	42.5	29.1	56.7	90.7	122.5	100.4	74.5	104.8	55.9
Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Corn	0.1	.2	.7	1.1	1.4	.9	1.6	1.9	2.4	6.8	8.5	18.7	27.4	2.6
Other Crops	15.1	25.7	32.7	42.3	49.7	55.2	56.8	74.3	93.1	100.2	113.3	144.6	122.7	64.3
Total Livestock	155.0	199.3	238.6	330.6	334.2	348.2	358.7	385.8	493.2	561.7	592.7	619.0	664.6	384.3
Other Cash Receipts	3.9	4.0	16.2	15.1	10.2	22.0	30.0	21.7	21.4	11.0	12.9	28.0	12.6	16.5
CASH RECEIPTS FROM FARMING	320.1	364.0	492.0	631.2	830.5	942.4	895.0	899.3	1132.1	1308.4	1457.5	1633.9	1713.5	895.3
Supplementary Payments	2.7	5.6	.2	.2	--	.2	--	--	--	--	6.1	21.4	4.0	1.2
TOTAL CASH RECEIPTS	322.8	369.6	492.2	631.4	830.5	942.6	895.0	899.3	1132.1	1308.4	1463.6	1655.2	1717.4	896.5

Source: Statistics Canada, Farm Cash Receipts, Catalogue No. 21-001, 1961/82.

Table 7b

Farm Cash Income by Source, Saskatchewan
1961-82

Source	1961/70 Av.	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1971/80 Av.
	millions of dollars													
Wheat	384.6	422.6	536.5	594.3	1016.3	1090.2	1034.1	1073.2	1129.5	1233.5	1763.1	1880.5	2184.2	989.3
Wheat, CWB Payments	111.8	47.2	80.1	229.5	323.7	546.1	264.3	74.1	87.1	311.4	276.3	733.0	279.2	224.0
Oats	6.7	11.5	5.3	6.5	14.6	16.4	18.8	12.4	10.9	6.0	7.8	9.8	7.2	11.0
Oats, CWB Payments	2.1	.4	2.4	4.0	--	9.1	4.6	4.8	1.4	--	.2	--	0.2	2.7
Barley	25.3	75.7	97.3	88.1	186.1	172.5	148.3	88.3	133.9	160.2	142.3	222.4	221.7	129.3
Barley, CWB Payments	5.4	6.5	1.3	43.2	39.4	66.5	16.7	36.7	29.5	17.2	17.0	45.0	38.9	27.4
Western Grain Stabilization Payments	--	--	--	--	--	--	--	--	67.9	150.4	--	--	--	21.8
Crop Insurance Payments	--	.1	1.3	4.4	10.0	40.9	21.8	27.2	28.0	103.0	135.3	92.0	82.0	37.2
CWB Net Cash Advance Payments	4.8	-57.1	-12.9	5.9	6.7	-9.8	38.3	-5.3	16.6	-20.3	-16.9	58.1	-4.9	-5.5
Deferred Grain Receipts	--	--	--	-193.4	-423.1	-480.3	-367.2	-290.2	-242.5	-281.8	-446.7	-554.3	-472.4	-272.5
Liquidation of Deferred Grain Receipts	--	--	--	--	193.4	423.1	480.3	367.2	290.2	242.5	281.8	446.7	554.3	227.8
Rye	4.3	5.6	6.3	8.4	9.2	9.7	12.1	9.4	10.2	18.1	32.9	28.4	23.8	12.2
Flaxseed	15.6	29.8	30.2	62.6	51.4	31.6	25.3	35.0	34.9	48.6	65.7	39.2	36.9	41.5
Canola	17.0	74.2	71.8	136.8	153.4	112.8	115.0	188.6	244.5	329.3	251.0	234.7	244.9	167.7
Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Corn	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Crops	8.6	11.4	11.1	22.3	37.6	23.6	23.2	26.6	29.5	29.7	41.7	45.9	71.8	25.6
Total Livestock	203.7	260.3	325.4	419.6	448.3	450.8	473.6	481.8	613.4	679.1	726.9	657.6	741.3	437.6
Other Cash Receipts	4.2	3.0	36.4	35.7	20.9	7.2	16.9	33.4	15.2	6.2	10.9	17.2	32.6	18.6
CASH RECEIPTS FROM FARMING	792.3	891.1	1192.5	1467.9	2087.9	2510.4	2326.3	2163.2	2500.2	3033.1	3289.3	3956.4	4041.8	2146.2
Supplementary Payments	12.7	6.8	1.0	1.4	1.8	--	--	--	--	--	12.4	53.9	6.0	2.3
TOTAL CASH RECEIPTS	804.9	897.9	1193.5	1469.3	2089.7	2510.4	2326.3	2163.2	2500.2	3033.1	3301.7	4010.3	4047.8	2148.5

Source: Statistics Canada, Farm Cash Receipts, Catalogue No. 21-001, 1961/82.

Table 7c

Farm Cash Income by Source, Alberta
1961-82

Source	1961-70 Av.	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1971/80 Av.
	millions of dollars													
Wheat	139.2	128.9	163.9	165.3	320.2	361.0	352.2	338.9	290.5	370.5	585.9	922.4	850.6	307.7
Wheat, CWB Payments	40.8	18.5	23.7	61.0	99.2	151.6	74.1	21.7	20.9	76.2	70.4	233.0	111.4	61.7
Oats	7.4	8.2	6.2	8.6	17.5	18.2	24.2	20.4	15.6	14.3	27.8	25.6	24.1	16.1
Oats, CWB Payments	1.7	.3	1.3	2.5	--	6.8	3.0	3.8	1.9	--	--	--	0.3	2.0
Barley	42.0	77.9	67.5	82.6	181.9	208.4	213.4	160.9	168.1	222.3	292.2	417.3	415.0	167.5
Barley, CWB Payments	7.7	7.6	.8	34.6	34.0	51.5	18.3	50.8	37.5	20.5	18.9	48.8	55.6	27.4
Western Grain Stabilization Payments	--	--	--	--	--	--	--	--	27.6	59.6	--	--	--	8.7
Crop Insurance Payments	--	2.4	2.1	4.7	16.2	18.7	16.8	38.8	22.5	24.8	32.9	27.4	82.0	18.0
CWB Net Cash Advance Payments	2.8	-18.5	-8.8	-1.6	3.0	-.6	15.5	-1.4	1.4	-10.4	1.7	29.8	6.8	-2.0
Deferred Grain Receipts	--	--	--	-69.3	-133.7	-153.9	-128.2	-110.4	-73.0	-78.6	-143.5	-200.4	-168.7	-89.1
Liquidation of Deferred Grain Receipts	--	--	--	--	69.3	133.7	153.9	128.2	110.4	73.0	78.6	143.5	200.4	74.7
Rye	1.8	2.4	3.3	8.8	11.3	11.7	8.8	6.8	7.0	12.5	30.5	29.4	19.1	10.3
Flaxseed	10.7	12.5	10.6	17.9	22.7	11.6	12.4	9.6	9.1	17.8	29.6	16.0	13.9	15.4
Canola	14.9	45.7	64.5	76.3	130.0	101.0	80.5	183.2	236.7	314.7	304.5	277.4	235.2	153.7
Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Corn	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Crops	25.8	32.4	35.6	60.8	86.6	67.5	71.7	74.2	77.9	90.4	128.6	136.3	111.5	72.6
Total Livestock	358.1	463.2	551.4	756.1	830.7	891.0	920.8	988.7	1302.1	1599.3	1657.7	1708.8	1748.5	996.1
Other Cash Receipts	7.6	7.8	29.9	27.5	29.9	20.3	21.2	75.0	30.7	16.5	19.8	34.7	23.0	28.0
CASH RECEIPTS FROM FARMING	664.1	789.3	952.0	1235.8	1718.9	1898.5	1858.6	1989.2	2286.9	2823.5	3135.6	3850.2	3727.6	1868.8
Supplementary Payments	7.2	5.6	3.2	6.5	25.7	--	--	--	--	--	12.6	30.6	141.6	5.4
TOTAL CASH RECEIPTS	671.3	794.9	955.2	1242.3	1744.6	1898.5	1858.6	1989.2	2286.9	2823.5	3148.2	3880.8	3869.2	1874.2

Source: Statistics Canada, Farm Cash Receipts, Catalogue No. 21-001, 1961/82.

Table 7d

Farm Cash Income by Source, British Columbia
1961-82

Source	1961-70 Av.	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1971/80 Av.
	millions of dollars													
Wheat	3.8	5.1	4.4	3.6	5.1	3.6	4.3	4.7	4.5	5.4	11.0	20.3	13.2	5.2
Wheat, CWB Payments	--	.6	.6	1.2	1.4	2.1	1.1	.3	.3	.9	1.0	4.8	3.3	1.0
Oats	0.9	1.5	1.6	1.7	2.9	1.5	2.2	2.3	1.5	1.2	1.5	3.4	2.1	1.8
Oats, CWB Payments	--	.1	.2	.5	--	1.0	.4	.5	.3	--	--	--	--	.3
Barley	2.9	4.9	3.9	4.6	12.8	7.8	10.7	6.4	5.6	7.5	13.7	11.7	11.6	7.8
Barley, CWB Payments	--	.3	--	1.5	1.3	1.9	.7	1.9	1.4	.3	.7	2.4	1.8	1.0
Western Grain Stabilization Payments	--	--	--	--	--	--	--	--	1.1	1.6	--	--	--	.3
Crop Insurance Payments	--	1.3	1.1	.5	.8	.7	.7	1.5	1.2	3.5	2.2	5.9	6.2	1.3
CWB Net Cash Advance Payments	--	--	--	--	--	--	--	--	--	--	.2	1.1	0.7	--
Deferred Grain Receipts	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Liquidation of Deferred Grain Receipts	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rye	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flaxseed	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
Canola	--	.4	.7	1.4	5.1	3.8	3.3	4.3	10.2	14.5	17.5	6.1	9.3	6.1
Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Corn	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Crops	49.1	57.5	63.8	100.9	103.7	104.8	119.0	149.6	177.5	187.9	212.9	249.0	270.4	127.7
Total Livestock	115.4	147.0	169.7	223.7	252.0	267.1	288.4	297.5	349.5	416.1	473.5	523.6	558.5	288.5
Other Cash Receipts	2.6	3.0	4.5	6.5	22.0	28.7	50.3	47.2	29.7	13.4	15.5	35.1	68.1	22.1
CASH RECEIPTS FROM FARMING	174.3	221.7	250.5	346.1	407.1	423.0	481.1	516.2	582.8	652.3	749.7	863.5	945.2	463.1
Supplementary Payments	0.2	.2	--	1.7	1.5	--	--	--	--	--	--	.5	--	.3
TOTAL CASH RECEIPTS	174.5	221.9	250.5	347.8	408.6	423.0	481.1	516.2	582.8	652.3	749.7	863.9	945.2	463.4

Source: Statistics Canada, Farm Cash Receipts, Catalogue No. 21-001, 1961/82.

Table 7e

Farm Cash Income by Source, Canada
1961-82

Source	1961/70 Av.	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1971/80 Av.
	millions of dollars													
Wheat	623.3	646.3	829.0	870.1	1,548.1	1,699.2	1,642.8	1,650.3	1,674.7	1,908.4	2,763.5	3,247.8	3,565.3	1,523.2
Wheat, CWB Payments	172.3	75.2	118.4	331.2	506.1	826.9	412.2	131.0	126.9	452.4	433.1	1,156.4	463.7	341.3
Oats	30.4	31.7	26.4	30.8	55.6	60.2	70.7	57.4	47.7	34.9	50.4	57.1	54.1	46.6
Oats, CWB Payments	6.1	1.7	5.3	12.9	—	27.8	11.7	13.9	5.3	—	.4	—	0.6	7.9
Barley	83.8	192.3	217.3	229.5	468.5	465.7	451.3	319.8	398.2	493.8	546.5	804.7	831.9	378.3
Barley, CWB Payments	15.1	16.6	3.0	100.8	96.1	149.5	44.1	102.3	84.8	47.4	45.9	116.6	111.6	69.1
Western Grain Stabilization Payments	—	—	—	—	—	—	—	—	115.0	255.0	—	—	—	36.8
Crop Insurance Payments	—	7.7	14.9	19.9	40.9	85.4	65.1	97.1	75.6	200.9	261.9	172.2	239.3	66.7
CWB Net Cash Advance Payments	83.8	-84.6	-27.5	6.5	11.4	-13.9	58.4	5.7	17.7	-41.6	-20.0	118.9	2.8	-8.8
Deferred Grain Receipts	—	—	—	-305.2	-625.8	-695.4	-546.3	-434.0	-350.2	-405.6	-648.5	-823.5	-706.5	-401.1
Liquidation of Deferred Grain Receipts	—	—	—	—	305.3	625.8	695.4	546.3	434.0	350.2	405.6	648.5	823.5	336.3
Rye	8.1	10.0	12.1	20.5	25.0	27.1	27.7	21.4	22.2	38.6	81.6	75.5	57.2	28.6
Flaxseed	49.4	57.1	53.8	119.1	135.4	81.3	77.5	86.7	98.6	143.6	188.3	126.7	110.1	104.1
Canola	35.4	134.4	156.9	247.0	338.6	260.0	227.8	432.8	582.1	781.0	673.5	592.6	594.2	583.4
Soybeans	16.3	27.9	35.8	50.3	78.5	44.9	78.1	79.6	152.8	128.8	198.0	163.8	192.7	87.5
Corn	22.8	60.2	61.8	99.2	164.2	153.0	157.6	157.0	197.0	227.5	371.8	432.4	413.4	164.9
Other Crops	446.5	582.0	641.5	890.7	1,077.8	1,061.6	1,200.3	1,167.9	1,564.2	1,515.4	1,635.4	2,110.4	1,989.5	1,113.8
Total Livestock	2,200.0	2,641.3	3,136.7	4,010.3	4,453.2	4,876.3	4,974.9	5,262.1	6,579.1	7,733.3	8,585.6	8,969.3	9,637.9	5,205.3
Other Cash Receipts	105.7	130.4	225.4	242.8	316.0	376.7	420.9	493.0	390.9	396.4	404.8	555.6	490.0	339.6
CASH RECEIPTS FROM FARMING	5,793.4	6,530.2	7,510.8	8,976.4	8,994.9	10,112.1	10,068.2	10,190.3	12,016.6	14,258.4	15,778.0	18,524.8	18,871.0	9,843.6
Supplementary Payments	26.6	18.3	14.0	11.5	57.5	30.3	—	—	—	—	31.1	156.5	172.0	16.3
TOTAL CASH RECEIPTS	5,819.9	6,548.5	7,524.8	8,987.9	9,052.4	10,142.4	10,068.2	10,190.3	12,016.6	14,258.4	15,809.1	18,681.3	19,043.1	9,859.9

Source: Statistics Canada, Farm Cash Receipts, Catalogue No. 21-001, 1961/82.

The initial-final payments scheme administered by the CWB is part of the pooling of sales revenue which is intended to provide equal return for identical grain sold within the crop year. This has the effect of stabilizing returns to farmers within the year and reduces the need for farmers to make price decisions. Since prices (initial and final) for a given year are constant, the within year price variation is reduced. Looking at the change in final payments over the years indicates several significant features. First, final payments are usually relatively large--the initial payments are most often set well below prices which are realized; federal contributions in support of initial prices have been infrequent and small. Second, it appears that final payments have declined relative to initial payments indicating that initial payments have become somewhat better indicators of market conditions. However, in wheat, the 1971-81 average ratio of initial payments to total payments was about .82. The lag in transmitting signals and grain revenue is significant. Finally, there is contradictory evidence on the impact of final payments on stabilizing between-year revenue variation. In the case of wheat, there has been a tendency for final payments to increase as initial payments increased, while in barley, the reverse is true. It is unclear whether the between-year stabilization effect is from positive or negative correlations between initial prices and final payments but the series moving in opposite directions indicates that both cannot be stabilizing.

The Western Grain Stabilization program is a Federal government-producer shared contributory program. It was initiated in 1976, and establishes a stabilization fund by collecting one percent of the value of eligible sales[4] (up to a limit) from producers, with the Federal government contributing two percent. Payouts are made if average cash flow from grain sales, adjusted for cost changes over time, is below the previous five-year

average. Two payments have been made--1978 and 1979--in years of rising gross income. The payments were triggered because of the high five-year base associated with the high grain prices in the mid 1970's and the rapid rise in production costs which followed. This program will serve to even out grain cash flow over time, but the overall effect is likely to be small and more important as a macro variable than in influencing individual farmer behavior.

Crop insurance payments are receipts from provincial programs covering crop losses due to drought, frost, pest damage, hail, drown-outs, etc. These programs have been in existence since the mid-1960's and play a significant role in reducing natural risks in grain production. For example, during the 1980 drought in southern Manitoba and eastern Saskatchewan, crop insurance payouts approaching 190 million dollars were made. Since the payments were concentrated in the drought area, their micro impacts are likely quite different from similar amounts spread among producers over the entire province or provinces.

CWB Net Cash Advance Payments refer to payments administered for the Federal government by the CWB which provide interest-free funds to farmers for farm stored wheat, oats and barley. Payments are recorded as net, because at every point in time funds are being disbursed to some farmers and are collected from other farmers as deliveries are made. The effect of this program is to improve cash flow for farmers when deliveries through the CWB are slow. Payments represent only a speeding up of revenue generation on the portion of sales made by farmers through the CWB, and are net revenue generating only to the extent that improved cash flow may reduce interest costs elsewhere within farms or the industry.

Aggregatively, the numbers are small and likely have negligible influence on the grain industry.

Deferred Grain Payments refer to the opportunity, under Canadian Grain Commission regulations and the Income Tax Act, to accept a storage ticket on grain delivered into the handling system rather than cash. The rationale is to postpone revenue in CWB grains, and postpone revenue or speculate on price changes on non-Board grains. This instrument appears to be without precedent in other agricultural markets. If payment is deferred, the opposite of cash advances will occur; payment will be realized at a later date. The data indicate that the value of deferred payments is large, and that they are picked up in the subsequent year's revenue. For the producer, the role of deferred payments is financial management. For the industry, the movement of unsold grain into the system can have two effects: it permits markets to be served despite producers' desires to delay sales and for commodities traded on the futures market, it may result in increased hedging pressure which may change bases.

Another aspect of the farm income picture which might be discussed here is the size and distribution of transfer payments in the grains industry; however, this issue will be dealt with in the fourth section of this report.

Grain and Input Prices

Canadian grain prices are, for the most part, internationally determined. The method of regulating CWB grains and some of the methods used in Domestic Feed Grains pricing insulate Prairie grains from international forces but, over time, Canadian prices must follow those established in international trade. Table 8 provides point indicators of nominal and real prices over the past 20 years for Canadian wheat, barley, corn

Table 8

Nominal and Real Prices of
Specified Grains

	1961			1966			1971			1976			1981		
	NP[1]	Real Price (Inputs)[2]	Real Price (CPI)[3]	NP	Real Price (Inputs)	Real Price (CPI)	NP	Real Price (Inputs)	Real Price (CPI)	NP	Real Price (Inputs)	Real Price (CPI)	NP	Real Price (Inputs)	Real Price (CPI)
	$/tonne														
Wheat	63.20	85.87	84.27	64.67	75.02	77.45	49.60	49.60	49.60	105.46	61.67	70.83	185.19	66.50	78.17
Barley	48.23	65.63	64.31	48.23	55.95	57.76	31.69	31.69	31.69	88.19	51.57	59.23	127.23	45.68	53.71
Corn	47.64	64.73	63.52	57.87	67.13	69.31	46.45	46.45	46.45	88.18	51.57	59.22	132.67	47.64	56.00
Canola	79.37	107.84	105.83	108.91	126.35	130.43	95.24	95.24	95.24	267.64	156.51	179.74	279.98	100.53	118.18

[1]NP = nominal price, Canada estimated annual average.

[2]NP deflated by Input Price Index: a proxy for prices after cost adjustment (1971 = 100).

[3]NP deflated by the Consumer Price Index: a proxy for removing the effect of inflation (1971 = 100).

Sources: Statistics Canada, Quarterly Bulletin of Agricultural Statistics, Cat. No. 21-003, 1961/81.
Statistics Canada, Farm Input Prices, Catalogue No. 62-004.
Statistics Canada, Consumer Price Index, Catalogue No. 62-001.

and rapeseed. Because of their longer term correlation with international prices, they can also be used as indicators of the general path of world trade prices.

Nominal prices were relatively steady throughout the 1960's, dropped significantly in the early 1970's, then rose dramatically in 1973 through to 1976. In nominal terms, recent grain prices are at all time highs. The smallest increases (and decreases) in nominal terms have occurred in feed grains; over the 20 years examined, wheat prices nearly tripled. Oilseed prices have almost quadrupled between 1961-81 reflecting the increased demand for protein feed sources around the world. Part of the increase in grain prices in Canada since 1976 has been due to the decline in the value of the Canadian dollar in relation to other currencies. For most of the latter half of the 1970's, the U.S. and Canadian dollars were weak in relation to most currencies, providing upward pressure on North American export prices. With the strengthening of the U.S. dollar in the past two years, this process has reversed somewhat; however, the Canadian dollar is lower today in relation to the U.S. dollar than it was throughout the 1970's. Consequently, Canadian grain prices have been supported by the decline in value of the Canadian dollar.

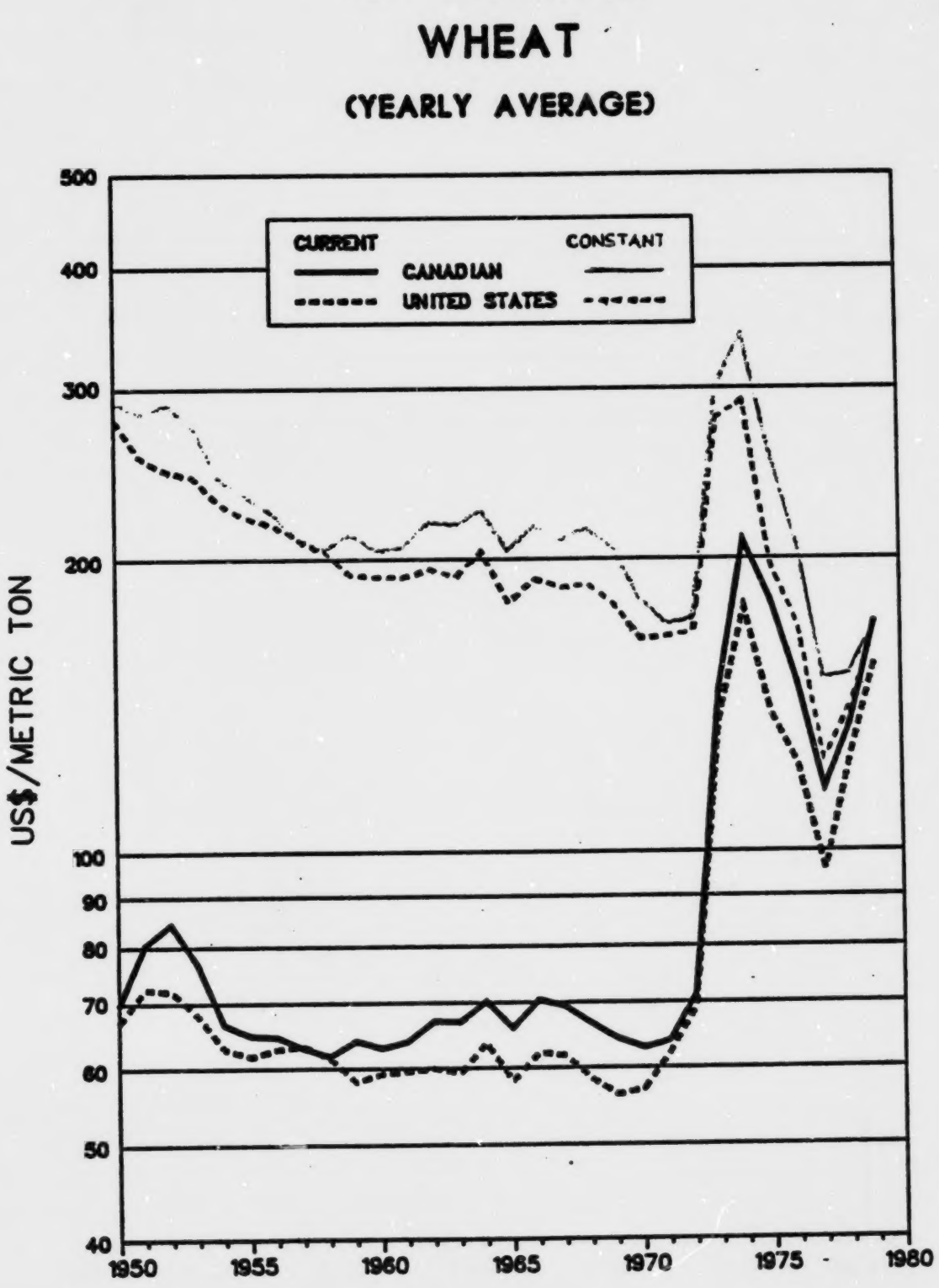
The data on so-called "real" grain prices gives a different picture. Two measures of real prices are given in Table 8. The Real Price (Inputs) deflates nominal prices by an index of input prices to provide a rough, but biased[5], estimate of prices after increase in production costs have been removed. The Real Price (CPI) deflates nominal prices by the All Items Consumer Price Index to estimate (probably unsatisfactorily) grain prices after the effect of inflation has been removed. In real terms, all prices except rapeseed declined between 1961 and 1981. Prices were extremely low

in 1971 in the midst of a world glut of grain, and they rose significantly through the high price period between 1973 and 1976. The price of wheat is higher in real terms today than in 1976 but lower than in the 1960's. The data do suggest, however, that depending on how much bias one might attach to the deflators, the decline in real prices, while genuine, may be relatively small. This is consistent with Martin and Brokken, who found that for the past 125 years real maize prices have shown no trend but real wheat prices have displayed a downward trend. Reference to the World Bank real price series in Figures 1, 2 and 3 clearly show that real prices have fallen in the past 30 years. Rapeseed has been the exception to this pattern, with only moderate declines in 1971, a large increase in the early 1970's, and maintaining its 1960's levels recently. These data do support the argument that very tight and unusual world trade conditions are required to reverse the downward slide of real grain prices.

Table 9 provides additional comparisons of input prices and product prices. The most rapid rise in input prices occurred between 1973 and 1974 but was cushioned by rising product prices. Despite the rapid rise in costs and some production problems in 1974 and 1975, the 1973-76 period was extremely buoyant for Prairie farmers and farm related industries. Net farm incomes set records, machinery sales boomed, land prices soared, pesticide and fertilizer sales took off, and the beginnings of a new era in Prairie agriculture were established on the basis of the new-found funds that existed in those years.

Costs and prices have continued to rise in the 1980's, but for the first time in over a decade, input prices dropped in 1982 (fertilizer and interest rates primarily). If the data can be believed, input prices rose in western Canada slightly more than in Canada as a whole, probably reflecting the importance of petroleum-based inputs in the mix of western

Figure 1 Real Wheat Prices

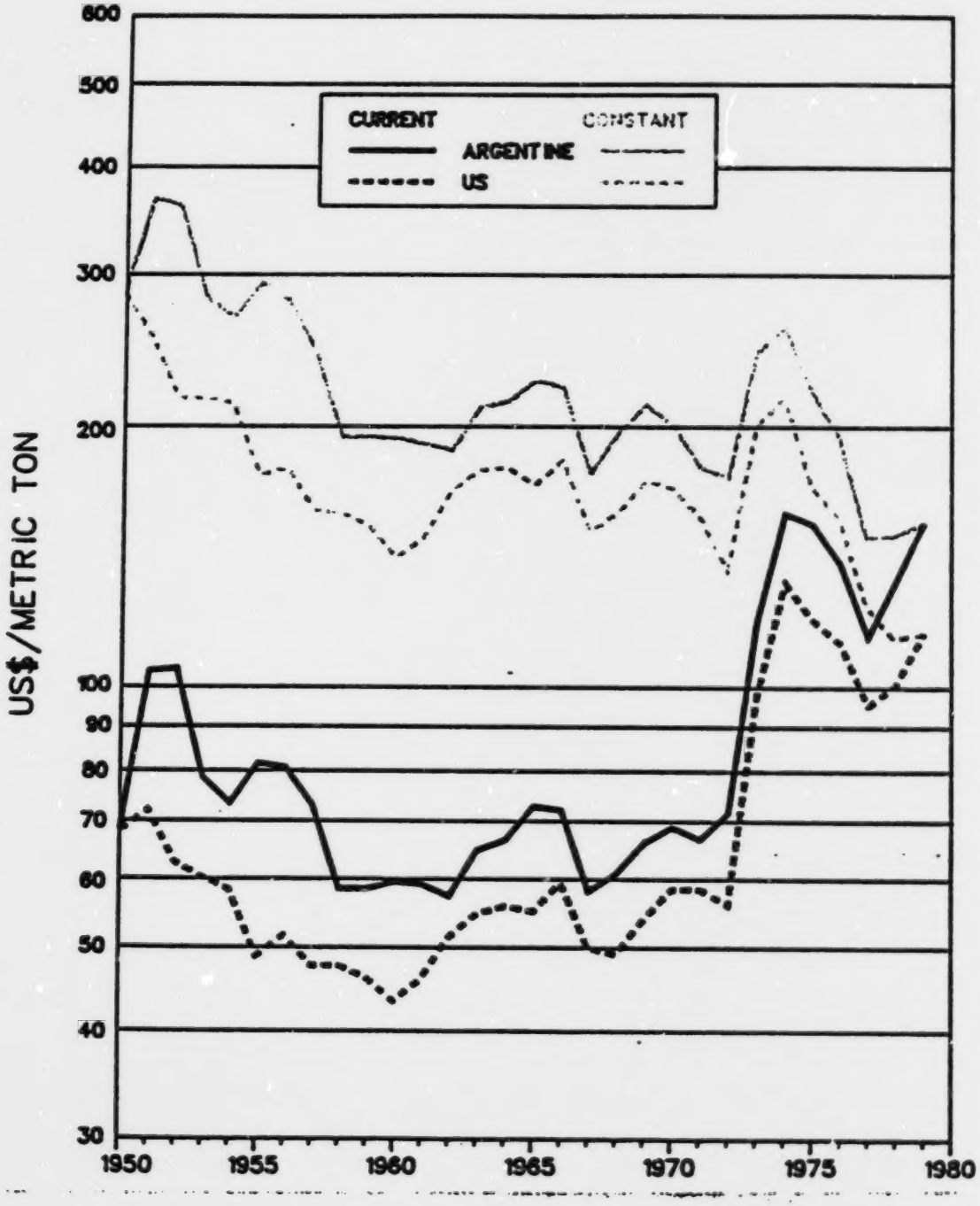


SOURCE: WORLD BANK, COMMODITY TRADE AND PRICE TRENDS, Aug. 1980.

Figure 2

MAIZE

(YEARLY AVERAGE)

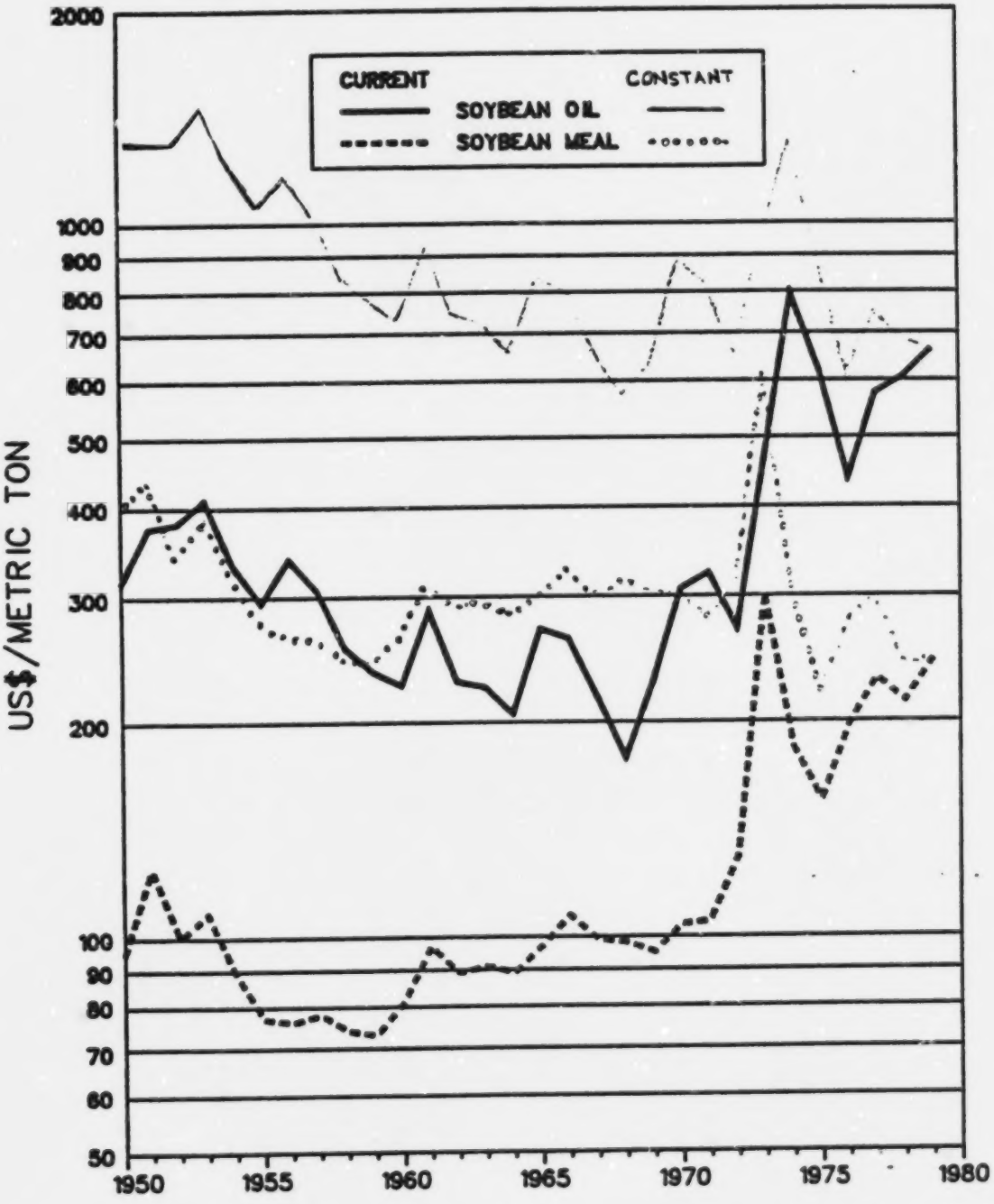


SOURCE: WORLD BANK, COMMODITY TRADE AND PRICE TRENDS, Aug. 1980.

Figure 3

SOYBEAN OIL AND SOYBEAN MEAL

(YEARLY AVERAGE)



SOURCE: WORLD BANK, COMMODITY TRADE AND PRICE TRENDS, Aug. 1980.

Table 9

Indexes of Input Prices, Production, and Prices Received
Crops 1962, 1966, 1971/81
(1971 = 100)

	Index of Crop Inputs		Crop Production Index				Index of Prices Received by Farmers			
	Western Canada	Canada	Man.	Sask.	Alta.	Canada	Man.	Sask.	Alta.	Canada
1962[1]	n/a	n/a	78.5	73.6	78.1	77.8	n/a	n/a	n/a	n/a
1966	n/a	n/a	75.0	111.8	131.4	106.6	113.9	120.9	108.2	104.0
1971	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1972	103.7	102.9	80.2	77.0	106.5	83.0	117.0	116.0	119.2	113.7
1973	119.7	122.6	88.8	87.1	103.4	92.9	277.8	222.5	229.4	202.7
1974	191.6	192.1	62.9	70.3	90.1	80.0	319.6	317.8	319.5	273.7
1975	236.6	226.7	92.6	92.3	130.6	106.0	281.2	282.7	283.4	246.4
1976	229.5	210.1	107.0	119.0	144.5	121.9	246.8	245.8	250.9	226.4
1977	219.7	212.5	135.0	114.3	126.3	124.6	275.3	224.7	230.7	213.5
1978	227.4	225.5	143.3	122.5	156.3	132.4	229.9	241.0	238.9	224.8
1979	251.2	253.8	115.8	88.2	149.1	111.4	281.4	298.5	283.1	265.4
1980	313.5	305.4	91.6	93.1	179.8	120.6	343.6	360.9	346.5	312.3
1981	358.5	340.5	155.2	122.1	198.5	148.8	358.7	377.1	365.0	337.0
1982	337.4	335.9	176.9	132.1	197.7	160.8	318.3	332.0	324.7	304.0

[1]1962 crop production index presented because the census year, 1961, was a dry year on the Prairies with serious crop reductions.

Sources: Statistics Canada, Farm Input Price Index, Cat. No. 62-004, 1971/81.
Statistics Canada, Index of Farm Production, Cat. No. 21-203, 1971/81.
Statistics Canada, Index Numbers of Farm Prices of Agricultural Commodities, Cat. No. 62-003, 1971/81.

inputs. The data also indicate that product prices have risen more in the west than in Canada as a whole. If any significance can be attached to this observation, in 1981 input and product prices in the west had increased approximately the same amount.

All of these observations point to the general conclusion that the 1970's produced a significant boom in the western Canadian grain economy, but still favorable conditions have carried on into the 1980's. Of course, these generalizations have exceptions, such as drought in a wide spread area in 1980, frost in Saskatchewan in 1982, large grain inventories in 1978, and so on. However, western grain production has entered the 1980's in a reasonably healthy state; it has undergone a major technological change, and up to 1982 and 1983, has continued to improve its financial position.

Farm Asset and Debt

Farm debt has grown rapidly in the past decade. This situation, along with the widely publicized farm bankruptcies in 1981-83, has been used by farm organizations and politicians to provide a public picture of an agricultural industry in serious financial trouble. A popular argument against changes in the statutory freight rates on grain was that increased freight rates would drive already financially troubled grain producers out of business, implying part of Canada's grain production would disappear.

Table 10 shows that the magnitude of farm debt has certainly increased, and that it has increased very rapidly. At the national level (the only available data), total farm debt increased slowly in the early 1970's, averaging about 5.0 billion dollars from 1971-73. By 1981, debt had increased three and one-half times to over $17.0 billion. However, during this same period farm capital and equity increased proportionally more. Farm capital has increased from about $24.0 billion, and farm equity from over $19.0 billion in 1971, to $130.0 and $113.0 billion in 1981, respectively. As a consequence of these relative changes, the debt-equity ratio in Canadian agriculture has declined from over 20 percent in the early 1970's to 15 percent in 1981. This aggregate debt-equity ratio continued to decline as the publicity which focussed on financial problems within the industry increased. Although these data represent all Canadian farms, an alternative analysis of crop production (Canada) with different data showed the same trend. Consequently, in Canada the relative size of farm debt has declined, and there is no reason to expect the situation in Prairie grain production would be any different.

A major reason that capital, equity and debt have risen rapidly in Canadian agriculture has been the rapid rise in farmland prices (Table 11). Estimates of the levels of Prairie farmland prices vary, but they indicate that land prices are very responsive to the relative health of the grain market, and that the 1970's produced a boom in farmland prices. Compared to farmland in U.S. grain producing states, Canadian prices generally started lower in the 1960's and have increased more as a consequence of the favorable grain markets in the 1970's (Table 12).[6] Increases in land prices in Alberta and Manitoba appear to have been similar since 1971 although Alberta prices are considerably higher than Manitoba's.

Table 10

Canadian Farm Debt-Equity Ratios,
1971/81

Year	Gross Farm Capital	Farm Debt	Equity	Debt/Equity
	.....$'000.....			
1971	23,882,011	4,564,296	19,317,715	.24
1972	26,224,685	4,830,767	21,393,918	.22
1973	31,658,050	5,557,025	26,101,025	.21
1974	39,819,361	6,529,713	33,289,648	.20
1975	48,283,092	7,828,690	40,454,402	.19
1976	57,038,382	9,057,948	47,980,434	.19
1977	64,529,042	10,306,717	54,222,325	.19
1978	76,864,888	12,013,367	64,851,521	.18
1979	95,350,399	14,156,476	81,193,923	.17
1980	117,037,690	15,875,876	101,162,000	.16
1981	130,387,708	17,352,454	113,035,000	.15

Source: Statistics Canada, Cansim Data Base.

Table 11

Farmland Prices on the Prairies and
Selected U.S. States
1963-1981 and 1970-1979

	Manitoba		Saskatchewan	Alberta		North Dakota	Iowa
	Stat. Can.[1]	UM[2]	Stat. Can.[1]	Stat. Can.[1]	UM[2]	U.S.D.A.	U.S.D.A.
	$/acre						
1961	54	--	37	51	--	--	--
1962	55	--	40	54	--	--	--
1963	59	--	47	59	--	--	--
1964	66	--	55	66	--	--	--
1965	75	--	66	76	--	--	--
1966	82	--	76	84	--	--	--
1967	91	--	84	94	--	--	--
1968	97	--	86	102	--	--	--
1969	90	--	76	100	--	--	--
1970	84	--	70	92	--	94	392
1971	83	56	69	93	68	98	414
1972	83	60	69	94	83	108	466
1973	95	75	80	106	92	144	597
1974	121	105	100	136	119	195	719
1975	138	131	130	166	145	228	903
1976	161	199	158	183	177	258	1,219
1977	172	220	166	190	213	273	1,268
1978	198	241	192	205	269	306	1,458
1979	218	283	223	284	324	352	1,706
1980	--	326	279[3]	--	386	--	--
1981	--	372	345[3]	--	444	--	--

[1] Based on a survey of farmers. Discontinued in 1980.

[2] Farmland prices 1971-1981, average price of all bona file sales exceeding 40 acres.

[3] Farmland prices 1980-81, survey of transactions collected by Saskatchewan Land Bank Commission.

Sources: Statistics Canada, Agricultural Division, Farmland Price Series.
Dr. D.F. Kraft, Department of Agricultural Economics, University of Manitoba.
Unsourced U.S.D.A. table.
Saskatchewan Department of Agriculture, Farm Business.
Alberta Agriculture, Management Section.
Agricultural Real Estate Values in Alberta, 1971-81.

Table 12

Indexes of Farmland Prices on the Prairies and Selected U.S. States 1961-1981 and 1970-1979 (1971 = 100)[1]

	Manitoba		Saskatchewan	Alberta		North Dakota	Iowa
	Stat. Can.	UM	Stat. Can.	Stat. Can.	UM	U.S.D.A.[2]	U.S.D.A.[2]
1961	65	--	54	55	--	60	60
1962	66	--	58	58	--	61	62
1963	71	--	68	63	--	65	63
1964	80	--	80	71	--	69	66
1965	90	--	96	82	--	72	69
1966	99	--	110	90	--	78	77
1967	110	--	122	101	--	83	86
1968	117	--	125	110	--	88	91
1969	108	--	110	108	--	96	96
1970	101	--	101	99	--	98	99
1971	100	100	100	100	100	100	100
1972	100	107	100	101	118	105	105
1973	114	133	116	114	135	117	122
1974	146	187	145	146	175	160	163
1975	166	233	188	178	213	219	202
1976	194	355	229	197	260	256	253
1977	207	392	241	204	313	288	342
1978	239	430	278	220	396	305	356
1979	263	505	323	305	476	341	409
1980	--	582	404	--	568	389	478
1981	--	660	500	--	653	425	516

[1] Indexes are simple arithmetic transformations from Table 11 with 1971=100.

[2] Indexes are derived from USDA figures. on a survey of farmers, discontinued in 1980.

Sources:
- Statistics Canada, Agricultural Division, Farmland Price Series.
- Dr. D.F. Kraft, Department of Agricultural Economics, University of Manitoba.
- United States Department of Agriculture, Agricultural Statistics, 1961/82.
- Saskatchewan Department of Agriculture, Farm Business Management Section.
- Alberta Agriculture, Agricultural Real Estate Values in Alberta, 1971-81.

Saskatchewan prices appear to be slightly lower than in Manitoba and have increased somewhat less than the other two provinces. In view of the high proportion of summerfallow in Saskatchewan and its stability over time, it may be somewhat surprising that Saskatchewan farmland prices have behaved as they have.

Overall, these farmland price increases have been large. Although they may not be realized by farmers, they do reflect increases in wealth, and, obviously, borrowing power. While the conclusion reached above on the declining burden of farm debt might require some qualification because of the difference between realized and book wealth,[7] we do not view this as the most important implication of these data. It is the distributional aspect of debt discussed below which is most important to the health and development of agriculture. This is the same argument which is gaining some acceptability among economists and policy makers dealing with the farm income question--that adequacy of farm income and rates of return within agriculture tend to be superficial in aggregates, and depend upon <u>who</u> is earning them.[8]

The bankruptcies issue has received wide public attention since 1981. Table 13 summarizes all farm bankruptcies by the major provinces from 1979-83, with a disaggregation for field crop farms. Bankruptcies have certainly increased in recent years, and the increases are coincident with the period of high interest rates; however, costs are only one factor causing the increase in financial problems. Many of the failures appear to have also been attributable to market conditions in the livestock sector, cropping problems in individual situations, and over expansion in other cases. The Prairies had 78 out of the 410 bankruptcies in 1982 and 121 of 390 to October of 1983. Prairie crop farmers generally avoided the increase in financial foreclosures until 1983 when over one-third of the

Table 13

Farm Bankruptcies[1] by Province, 1979-83

	Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Canada	
	Field Crops[2]	Total	Field Crops	Total	Field Crops	Total	Field Crops	Total	Field Crops	Total	Field Crops	Total
1979	5	16	2	14	0	1	8	65	1	14	17	125
1980	4	8	12	16	4	14	19	123	2	44	44	222
1981	2	18	4	19	3	14	21	140	0	54	31	261
1982	3	24	7	24	17	30	52	176	4	143	83	410
1983[3]	23	38	17	36	17	47	45	139	3	91	110	390

[1] Includes bankruptcies of both incorporated and unincorporated farms.

[2] Farms classified as producing only field crops are reported here.

[3] January to October 1983.

Source: Personal communication, Bankruptcy Division, Consumer and Corporate Affairs Canada.

bankruptcies have been in crops. It is recognized that official bankruptcies do not totally reflect financial problems in the industry.

Other than the individual hardship (for the farmers and unsecured creditors) which are associated with financial collapse, the most significant aspect of these bankruptcy records is the smallness of the numbers. Even though they tripled for Canada between 1979 and 1982, farm bankruptcies in 1982 were still only 0.13 percent of the total number of farms. The increase from one (1979) to 47 (1982) in Manitoba represented only 0.16 percent of Manitoba farmers in 1982. Consequently these data and the other debt data presented above do not present a picture of an industry on the brink of financial collapse. Many producers have had problems, some have failed and others may still fail as a consequence of problems experienced over the past five years. Unlike most other industries, financial failure within agriculture represents primarily a change in ownership and control of the same resources, not a net loss in production. At the rates of failure that have been experienced, neither do they give rise to a perceptible change in the structure of production. As a result, while the increased financial squeeze on some farmers in the early 1980's has been severe, the aggregate situation is considerably different.

The key issue, then, is the distributional aspect of debt and how that may influence land transfer, ownership of agricultural facilities, and future production within agriculture. The distribution of debt within agriculture is extremely skewed. For example, in 1981 in Saskatchewan, about one-third of the farmers had no debt, another one-third of farmers had debts of $25,000 or less while the remaining farms held most of the debt. Presumably the farmers with most of the debt are young or beginning farmers.

Because land is so important to grains production, debt is particularly important in grains. Over the long term, this situation may have an impact on regeneration of the grain industry, both in terms of the rate of change, and who is part of the change. Those already in the industry, or their offspring have an advantage in beginning or expanding farming operations. Tax, credit, farmland ownership and other policies by governments reinforce these advantages. Regeneration is increasingly becoming internalized to the existing structure of farmers. That this situation will improve or reduce Canada's ability to produce is unclear, although it might be asserted that the need or desire to optimize (production, input use, marketing opportunities), and the willingness to take risks are partly conditioned by pressures of making payments and servicing debt.

Although there are no research results to support the hypothesis, production practices and production have changed more in Alberta and Manitoba in the 1970's than in Saskatchewan partly due to the fact that the turnover in farms was much greater than in Saskatchewan. This is, however, a policy issue of more social consequence than it is of consequence to growth in the grains industry on the Prairies.

Grains and Economic Activity

Tables 14 and 15 provide separate measures of the importance of grains and agriculture in the provincial, Prairie and Canadian economies. Table 14 compares grain and agricultural sales with Gross Provincial Product and Gross National Product. These data do not provide shares of GPP or GNP since the recording of only sales data results in double counting in a national accounting framework. They are, however, the only direct way to

Table 14

Contribution of Grains to Gross Provincial Product, Gross National Product and Total Agricultural Value 1981[1]

	Total Crop Prod'n	Total Value Crops	Total Value Live-Stock	Total Value Prod'n	GPP or GNP	Grains % of Total Ag. Value	Grains % of GPP or GNP	Total Ag. as % of GPP or GNP
	('000 tns)	.....$,000,000.....				.....%.....		
Manitoba	7,616	1,007.6	621.7	1,665.4	12,786.0	60.5	7.9	13.0
Saskatchewan	19,741	3,169.0	647.6	4,018.4	14,907.0	78.9	21.3	27.0
Alberta	15,643	2,100.6	1,704.7	3,873.8	46,209.0	54.2	4.5	8.4
Prairies	43,000	6,277.2	2,974.6	9,557.6	73,902.0	65.7	8.5	12.9
CANADA	52,441	9,116.6	8,964.0	18,835.3	331,338.0	49.0	2.80	5.6

[1] Valued at market prices.

Sources: Canada Grains Council, Statistical Handbook'82.
Statistics Canada, Domestic Product by Industry. Cat. No. 61-213, 1981.

Table 15

Contribution to GDP at Factor Cost by
Various Industry Sectors, 1981

	Agriculture	Forestry	Mining[1]	Manufacturing	Gross Domestic Product GDP	% of GDP			
						Ag.	Forestry	Mining	Mfg.
	.....$000,000.....					.....%.....			
Manitoba	902.2	16.5	397.5	1,760.2	11,672	7.7	0.1	3.4	15.1
Saskatchewan	2,468.1	34.4	1,329.2	679.1	13,640	18.1	0.2	9.7	5.0
Alberta	2,128.5	53.8	9,782.4	3,379.2	42,602	5.0	0.1	23.0	7.9
Prairies	5,498.8	104.7	11,509.1	5,818.5	67,914	8.1	0.2	16.9	8.6
Canada	10,181.7	2,030.2	17,288.7	62,548.2	304,151	3.3	0.7	5.7	20.6

[1]Includes milling, quarries and oil wells.

Sources: Statistics Canada, Provincial Gross Domestic Product by Industry, Catalogue No. 61-202, 1981.
Manitoba Bureau of Statistics, Manitoba Statistical Review, 1982.

separate grains from agriculture. Table 15 uses the national accounting definition of agriculture and provides comparisons between provinces and with other sectors.

In Manitoba and Alberta, grains represent half of agricultural output, and represent 7.9 percent and 4.5 percent of GPP, respectively. Four-fifths of agricultural production in Saskatchewan consists of grains, and the importance of grain in Saskatchewan in terms of GPP is five times greater than in Alberta and three times greater than in the province of Manitoba. Because of these large provincial differences, the Prairie averages (63 percent relative importance of grains in agriculture and 8.2 percent against average GPP) do not provide a representative picture of the importance of grain in the Prairies. For Canada, grain accounts for about 36 percent of all agricultural production, while agriculture sales and grain exports represent only 5.6 percent and 2 percent of GNP, respectively. Viewed in this context, grains might be considered to be of major importance only in Saskatchewan, and relatively unimportant at the national level. This is, however, an incomplete view.

Another aspect of the importance of agriculture is illustrated in Table 15 where three of the resource sectors are compared with manufacturing in the provincial and national accounts for 1981. Manufacturing represents a greater proportion of GPP in Manitoba and Alberta than does agriculture, but manufacturing is of much less importance than agriculture in the Saskatchewan economy; on the Prairies as a whole, agriculture and manufacturing are about equivalent in their contribution to GRP (Gross Regional Product). Mining, including oil and gas production, dominates in Alberta, but mining contributes only half as much as agriculture to GPP in Manitoba and Saskatchewan; on the Prairies, the influence of Alberta dominates, with the share of GRP attributable to the mining sector being

twice that of agriculture. Forestry is relatively unimportant in all of the Prairie Provinces. For Canada as a whole, manufacturing accounts for a fifth of GNP, while mining and agriculture represent only 5.7 and 3.3 percent of GNP, respectively. Consequently, with the exceptions of forestry and mining in Manitoba, the natural resource-based sectors are of much greater relative importance to the Prairie provinces than to Canada generally. Agriculture and grain are the dominant factors in the Manitoba and Saskatchewan economies, respectively, while oil and natural gas dominate in Alberta. Manitoba is the only Prairie province with a large manufacturing base, and much of that is agriculturally related.

One other important feature of the grains industry is its contribution to exports and foreign exchange earnings. Table 24 in section IV shows that the (positive) contribution of grains to the merchandise trade account has been large and important. Of the cumulative net trade balance of $12.2 billion in the years between 1971 and 1980, agricultural trade contributed $10.9 billion dollars, of which grains represented about 75 percent. As a result, grains have been a major contributor to foreign exchange earnings even though the majority of grain exports are in the raw product form and represent limited value added past the farm gate.

Farms and Farm Size

Table 16 provides census year estimates of the number of farms and size of farms on the Prairies between 1961 and 1981. The data indicate that there has been a steady decrease in the number of farms and a steady growth in average farm size. Alberta has retained its farmer numbers to a greater degree than have the other two provinces and as a result, the province has experienced the smallest increase in farm size. During this same period, farm population on the Prairies has declined from about

Table 16

Number of Farms[1] and Farm Operators and Average Farm Size
in the Western Provinces, 1961/81

	1961			1966		1971			1976		1981		
	No. of Farms and Farm Operators	No. of CWB Permit Holders	Average Farm Size (Acres)	No. of Farms and Farm Operators	Average Farm Size (Acres)	No. of Farms and Farm Operators	No. of CWB Permit Holders	Average Farm Size (Acres)	No. of Farms and Farm Operators	Average Farm Size (Acres)	No. of Farms and Farm Operators	No. of CWB Permit Holders	Average Farm Size (Acres)
Manitoba	45,306	41,888	351	39,747	411	34,981	33,124	514	32,104	562	29,492	25,829	639
Saskatchewan	93,904	103,795	686	85,686	763	76,970	82,876	845	70,958	923	67,318	71,533	952
Alberta	73,212	77,991[2]	645	69,411	720	62,702	60,886[2]	790	61,130	817	58,056	48,655[2]	813
British Columbia	19,934		226	19,085	277	18,400		316	19,432	311	20,120		268
Prairies	230,356	223,674	570	213,929	640	193,053	176,886	717	183,624	760	174,936	146,017	775

[1]Operations defined as census farms by Statistics Canada.

[2]Figures include those for British Columbia.

Sources: Statistics Canada, Census of Canada, 1961/81.
Canadian Wheat Board, Annual Report,. 1981/82.

766,500 to 480,800. Manitoba has experienced the greatest proportionate loss in farm population and farm numbers of the three provinces.

By themselves, these data have little significance to the purpose of this study. Obviously, even though farm populations and farm numbers are declining, the basic structure of farming on the Prairies in terms of number and size distribution of producing units has not fundamentally changed. More importantly, the cropped area has not changed significantly over the past 20 years; Manitoba has increased its cropped acreage, while the cropped acreages in Saskatchewan and Alberta have fallen slightly resulting in a very small net decline for the Prairies as a whole. As a result, the production base for Prairie grains remains much as it has been. The quality of the land base and the potential for expansion are discussed in the Section III.

Inputs for Prairie Crop Production

As a final measure of the role of the Prairie grain economies, we present some of the trends in inputs used by farmers. The value of purchased inputs (pesticides, fertilizers, fuels and seed) has undergone the most change, while the structure of the capital base, particularly in terms of machinery and equipment, has also undergone major change in the 1970's.

The values of inputs used in crop production provide a measure of the size of the input supply, production and distribution sectors as they relate to the Prairies. Fertilizer, pesticides and seed have shown the greatest growth while machinery and equipment, and land inputs have also increased dramatically. Part of these value increases are due to price increases, especially in the case of land; however, they are also occurring as a result of fundamental changes in farming practices over wide areas of the Prairies. Such changes include movement toward larger and

more convenient machinery, improved grain handling and storage facilities, improved farm buildings and shelter for equipment, and greater use of variable inputs. As a result of these ongoing changes, the grain industry has changed dramatically. At the same time, these changes have been accompanied by a dramatic increase in interest payments as a proportion of total production costs. This relative increase in interest payments from less than nine percent of total production costs in 1961 to over 15 percent in 1981, and the subsequent decline of about 14 percent in 1982 was, of course, exacerbated by the record high interest rates of the late 1970's and early 1980's; most of the increase occurred during the 1970's.

Table 17 and Figures 4 and 5 indicate that in addition to interest payments, the value of both fertilizer and pesticide inputs increased 40 times between 1961 and 1982. Fertilizers relative share of total production costs went from just over three percent in 1961 to just under seven percent in 1982, while pesticides accounted for just under one percent of total production costs in 1961 and over three percent in 1982. As was the case with interest payments, it was during the 1970's that the greatest increases in these costs occurred. The value of seed as an input into Prairie crop production increased 25 fold between 1961 and 1981, while its share of total production costs increased only sightly during that period.

The data also indicate that while the actual values of the remaining input costs increased significantly between 1961 and 1981, their share of total production costs declined (Figure 4). However, it must be pointed out that the data for these input categories were not disaggregated and thus represent inputs into all agricultural production.

Table 17

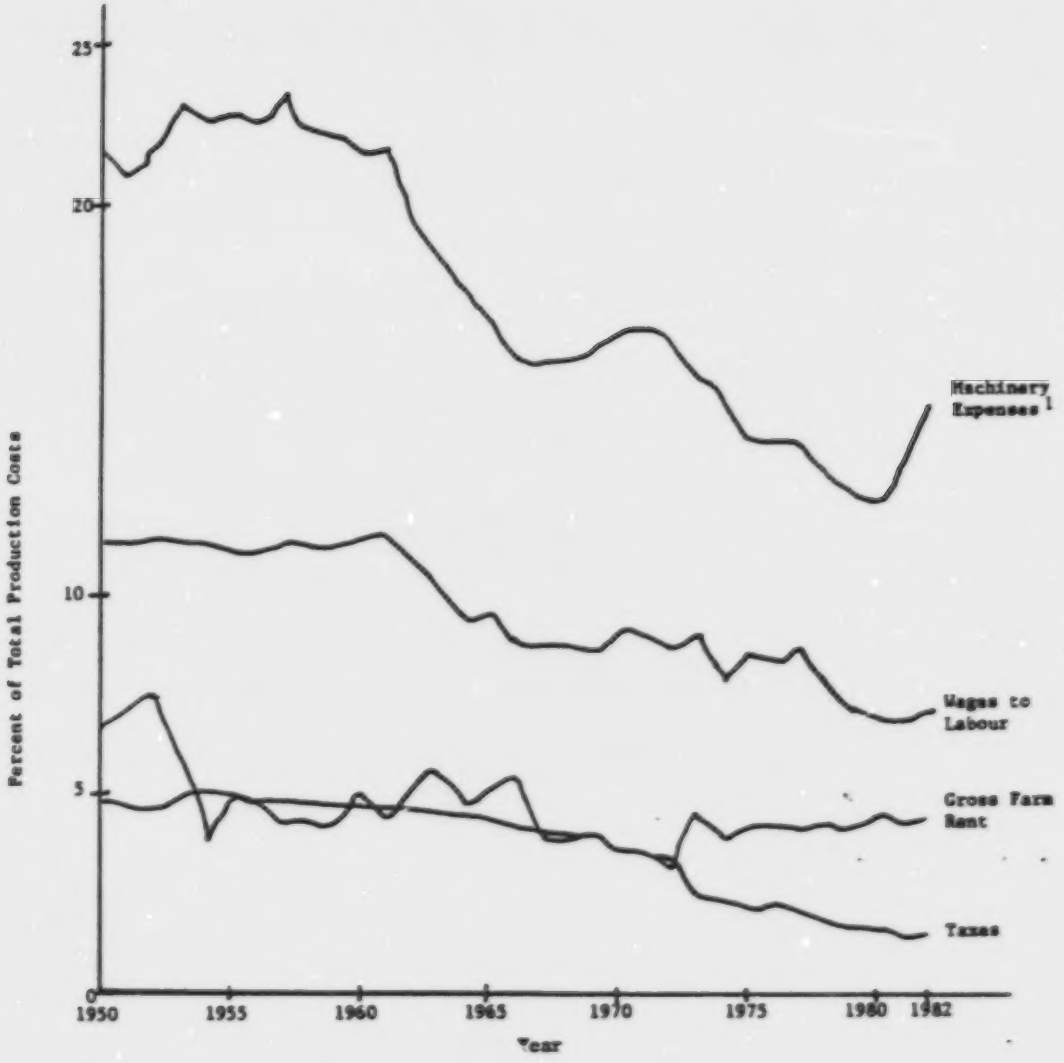
Value of Major Inputs into Agricultural Production
on the Prairies
1961-1981

	1961		1966		1971		1976		1981	
	Prairies	Canada	Prairies	Canada	Prairies	Canada	Prairies	Canada	Prairies	Canada
	.....				$000,000					
Operating Inputs										
Taxes	44.7	85.5	57.7	107.2	68.0	117.5	88.6	157.7	136.3	227.6
Gross Farm Rent	55.9	80.6	113.1	147.3	83.7	124.8	212.7	293.5	468.3	623.0
Wages to Labour	72.8	229.9	81.3	245.3	86.3	309.0	175.5	605.4	351.7	1,073.3
Interest	54.0	99.0	109.3	201.1	133.0	266.9	349.0	672.1	1,092.5	2,279.9
Fuel and Lubrication	127.1	203.5	131.5	216.9	156.2	264.7	289.6	431.8	681.8	999.0
Machinery Repairs	114.7	193.7	137.5	238.5	183.3	321.6	379.3	608.5	647.2	1,056.0
Fertilizer	16.5	77.0	65.1	159.4	57.4	160.0	229.0	472.0	642.2	1,081.6
Pesticides	12.2	23.5	16.8	40.5	16.6	44.2	104.5	186.6	312.2	482.3
Seed	12.8	30.3	17.8	62.0	30.3	97.5	49.1	162.1	106.5	309.4
Depreciation on Buildings	17.1	53.3	30.0	76.4	31.8	111.3	81.5	264.0	150.3	449.7
Depreciation on Machinery	169.5	266.8	246.0	378.2	273.9	441.7	700.1	1,076.4	1,290.3	2,011.9
Capital Inputs										
Land and Buildings	4,219.5	8,603.4	7,544.6	13,149,8	8,772.5	16,912.0	23,133.3	43,555.4	62,845.1	103,275.1
Machinery and Equipment	1,517.6	2,565.5	2,186.0	3,548.8	2,305.4	3,905.0	10,793.3	9,034.2	11,102.7	17,442.2

Source: Statistics Canada, Farm Income and Prices Handbook, Cat. No.

Figure 4

Declining Relative Farm Production Costs,
1950-1982, Canada

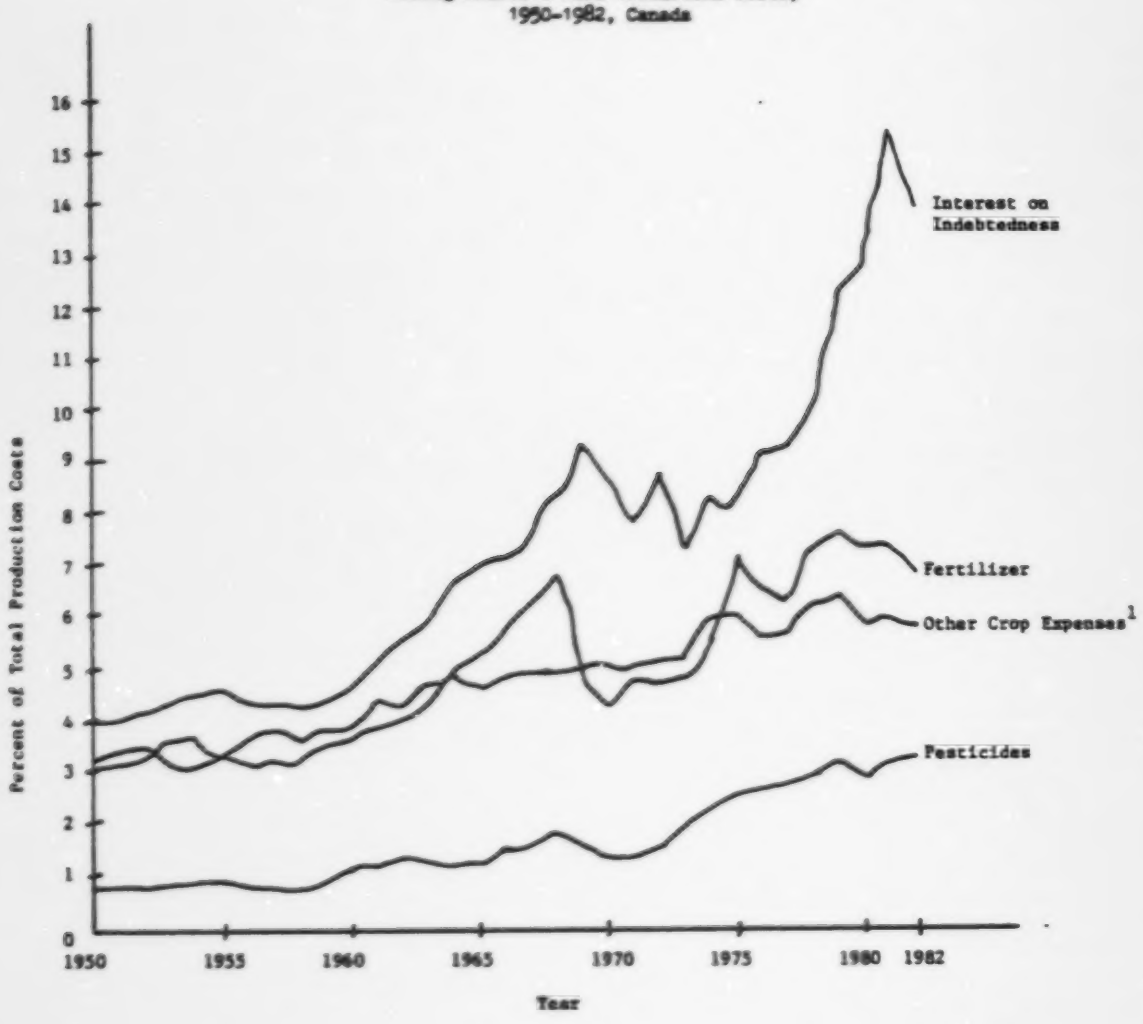


[1]Includes fuel and repairs.

Source: Compiled from Statistics Canada, Farm Income and Prices Handbook.

Figure 5

Rising Relative Farm Production Costs,
1950-1982, Canada



[1]Includes pesticides, seed, irrigation and twine, of which irrigation and twine are of little significance.

Source: Compiled from Statistics Canada, Farm Income and Prices Handbook.

FOOTNOTES

[1]J.L. Granatstein, A Man of Influence, (Ottawa: Deneau Publishers, 1981), pp. 71-71.

[2]Although no hard data on the number of people directly employed in the grain industry at the two ports were obtained, it is estimated that there are at least 800 employed by the Canadian Grain Commission and the elevator companies.

[3]Saskatchewan has a large livestock base, but it has tended to export calves and cows; the cattle finishing and processing sectors in Saskatchewan are relatively small.

[4]The seven eligible grains are wheat, oats, barley, rye, flaxseed, rapeseed, and mustard.

[5]Indexes of Input Prices should overstate increases in production costs because they do not reflect substitution among inputs as their relative prices change, and they neglect productivity improvements if these occur. The same logic suggests that the CPI may overstate inflation, although the argument is more tenuous.

[6]Prices on the Prairies continued upward in 1981 and 1982 despite high interest rates, whereas there appeared to have been a tendency for wheatland prices in the U.S. to stabilize while corn and soybean land prices actually dropped. Prairie prices are reported to have fallen in 1983 and into 1984.

[7]George L. Brinkman, "Agricultural Policy Formulation and Farm Income Data Needs," in Loyns, Freshwater and Beelen (editors), Proceedings of the Seminar on Revisions to Farm Income and Financial Statistics for Canada, pp. 30-33. Occasional Series No. 14, Department of Agricultural Economics and Farm Management, University of Manitoba, June 1983.

[8]Ibid., p. 29.

III. RESOURCES FOR GRAINS PRODUCTION ON THE PRAIRIES

The Soil Resource

The vast stretches of productive Prairie land were the driving force behind western Canadian development well into this century. The land base remains an essential element in the continued health of Prairie agriculture and is one of the more important constraints to rapid expansion of grain production. Grain production in western Canada always has been a form of extensive (as opposed to intensive) agriculture and that is unlikely to change in the foreseeable future. As a result of the importance of the land base to grains production, there are two popular views of the land base which are particularly relevant to this study and which have been explored in some depth.

The first view, emanating from the community of soil scientists in the west (in particular Dr. D.A. Rennie, University of Saskatchewan) and from some environmentalists and geographers, is that significant degradation of parts of the land base has occurred, and if allowed to continue will seriously inhibit our ability to increase (or sustain) grain production. The other view, less scientifically based and often heard from some politicians, is that there are vast tracts of land in Northern Alberta, north-eastern Saskatchewan, and in parts of northern Manitoba which will allow acreage, and therefore production, to expand substantially. These two views are not necessarily conflicting--if true, they could be offsetting. However, they very clearly have a bearing on the opportunity for development, or the likelihood of contraction, of western Canadian grains.

Canada is a land-rich country, but agricultural land is very limited in comparison to our total land area. The primary limitation is imposed by weather, but other factors such as soil depth, physical and chemical properties of soil and water, drainage and topography also limit the suitability of land to agricultural purposes. In addition, the willingness of farmers to accept more or less risk in land use depends on market conditions for their commodities.

About five percent of Canada's total land area (44.5 M ha) is considered suitable for sustained agricultural crop production (Classes 1 to 3); approximately 72.5 percent of this land (32.2 M ha) is located in the Prairie provinces.[1] Prairie grain acreage has averaged 22.3 M ha, and summerfallow has averaged 10.7 M ha, over the 1972-81 period.[2] Both land uses have been relatively stable. Acreage devoted to crops has fallen slightly in Alberta and Saskatchewan over the period under examination, while cropped acreage has risen in Manitoba; summerfallow acreage has fallen in both Manitoba and Alberta during the period but these declines have been dwarfed by the large and relatively constant summerfallow acreage in Saskatchewan. The Canada Grains Council[3] indicated in their 1982 publication, Prospects for the Prairie Grain Industry, 1990, that there remains 1.7 M ha of potential cropland in the Prairies, and that 1.2 M ha of this area will be cropped by 1990. Estimates by Kraft[4] of losses of cropland due to urbanization in the Prairies (36 to 146 thousand ha in 1990) indicate that these losses will be relatively unimportant in the next decade. The potential for increasing crop production, therefore, appears to depend primarily on better use of existing cropland.

Productivity of Prairie cropland has been increasing over the years. Hedlin and Rigaux[5] reported yield increases of 1.0 to 4.0 percent per year for wheat, and 2.2 to 4.4 percent for barley (depending on area and

cultural practices) over the period 1958-1976. However, these yield increases have been the result of managerial and technological innovations represented by the application of inputs other than land--fertilizer, herbicides, insecticides, improved varieties, and so forth, and generally favorable weather conditions over a considerable period of time. These inputs, and their role in grains development are discussed below.

Concurrent with the realization that productivity increases have come from the non-land inputs is a concern that the basic soil resource is undergoing depletion or degradation. Salinity, erosion and organic matter loss are the major sources of soil degradation. Each of these sources of degradation is partly or primarily management related--excess tillage and/or summerfallowing. The solutions to these problems are commonly accepted as increased use of continuous or extended cropping, reduction in summerfallow, reduced or zero (minimum) tillage, and increased use of forage crops. The Prairie Farm Rehabilitation Administration (PFRA) has projected that 4.6 M ha less summerfallow is feasible and culturally desirable.[6] Some of the reduced summerfallow would be used for forage crops, and the remaining cropped land which had previously been fallow would produce a less than proportionate increase in grain production. However, reducing fallow would improve overall land productivity and increase grain production; this change appears to be more important to production increases from the basic land resource than bringing new land under cultivation. Combined, reducing summerfallow and bringing new land into production would increase the productive land base in the Prairies by a maximum of 5.8 M ha by 1990, or about 25 percent. The increased production potential from such an increase in cropped acreage would likely be less than the average production attributable to existing acreage,

becaused productivity of the new and continuously cropped land would be less than that of the initial land base.

The Canada Grains Council (CGC) provides an alternative set of acreage and production estimates. They project a reduction in summerfallow of only 2.2 M ha, of which 1.6 M ha would be in Saskatchewan. This would mean that 5.0 - 5.5 M ha (about 30 percent) of cropped land in Saskatchewan would remain in summerfallow. The estimates made by the CGC of the land to be in crop production in 1990 was 24.2 M ha or 21.3 percent greater than the 1977-81 average acreage in crops. Combining this new acreage and yield increases with existing acreage, the Grains Council projected a 37 percent increase in total grain production relative to the 1977-1981 average and a 32 percent increase above the 1981 figure.

These magnitudes of increase in the productive land base and in output would be achieved only at considerable risk. They would also require new technology in moisture conservation and preservation, equipment, weed control, etc., and the incentives for producers to apply existing technology on a wider scale and to adopt new technology as it becomes available. They would likely also require additional attention from all levels of government, and public funds in research, demonstration, and extension. Finally, they would require more profit incentive than we are prepared to expect during the remainder of the 1980's. Therefore, the likelihood of major increases in the productive land base between now and 1990 is small. Increases of the magnitude indicated by both of the above studies are technically feasible but, in our view, are not likely to be achieved. Whatever increases are achieved will come primarily from summerfallow reductions, but even that potential will not likely be achieved.

Western Canada's land base is a renewable resource and it is being renewed. While degradation of land is occurring in some areas and is a

significant development, it does not appear to be a general problem in western Canada. Importantly, it is a problem which is being documented and researched, and efforts are being made to reverse it. These efforts will have to be continued, but the knowledge exists to control the problem if farmers have the incentives. New land development is limited by non-land risks (primarily weather) and will likely be relatively unimportant. Therefore, the largest potential for improved productivity and production in the Prairies lies with existing cropland, i.e., in reducing summer-fallowing and undertaking more continuous cropping, in encouraging the use of improved non-land inputs, and in providing the market environment which will reduce risk and provide incentives for capturing these opportunities. Land by itself (that is increased crop acreage) is not likely to be a major contributor to grains expansion to 1990, nor is it likely to reduce our production; development based upon significant new acreage does not appear feasible.

The Human Resource

The most important resource in Prairie agriculture which provides the management and most of the labour for grains production--people--seems to be the least documented. It is well known that farm numbers have been declining and that the age distribution of farmers has been shifting upwards for many years. It has been believed or accepted that farmers generally earn less income than the remainder of Canadians, and that they have generally lower education levels. The demise of the family farm has been forecast for decades. The conventional wisdom concerning farmers in Canada, even on the Prairies, has provided a rather dismal picture of the people and their status.

Conventional wisdom is often inaccurate or, at least, imprecise and this appears to be the case with regard to these issues. Also, some of the characteristics of the prairie farm population have begun to reverse earlier trends. Although we have been unable to document some of our propositions, the vantage point from which the authors have had the opportunity to view farmers from many parts of the Prairies provides some credibility to the arguments.

The data on characteristics of farmers are very limited (Table 18) but provides some information on the number of farmers and the change in age structure. Manitoba had the greatest decline in the number of farm operators (47 percent between 1961 and 1981), while the number of farm operators in Saskatchewan and Alberta declined about 40 and 26 percent, respectively. The change in age structure appears to be similar in Manitoba and Saskatchewan; the operators in the younger age groups either increased in number, or decreased less than in other areas, while the oldest group exhibited the largest decrease, indicating a shift to younger farmers. However, the data also indicate that the number of farm operators in the middle age groups (35 - 54) also declined significantly, suggesting a bimodal restructuring of age categories. In Alberta, the changes were much more uniform although they tended to favour some reduction in average age.

The farm income issue is one where a combination of statistical problems, aggregation error, and conventional wisdom have provided a very distorted picture of the actual income situation in farming[7]. It is the case that farm incomes, especially in grain, are more variable than many other income sources. It is also the case that official data show farm incomes to be low historically relative to average Canadian incomes. And

Table 18
Change in Numbers of Farm Operators as a Percentage of all Operators, by Age Class
1961-1981

	Manitoba			Saskatchewan			Alberta		
	1961	1981	%[1]	1961	1981	%	1961	1981	%
Total Reporting	43,306	29,442	-47.1	93,924	67,318	-39.5	73,212	58,050	-26.1
Less than 25 years	1,167	1,428	18.3	3,342	4,105	18.6	2,313	2,011	-15.0
25 - 34 years	6,130	5,800	-5.7	14,705	13,595	-8.2	11,882	10,419	-14.0
35 - 44 years	11,132	6,253	-78.0	24,315	12,818	-89.7	18,639	13,664	-36.4
45 - 54 years	11,861	7,008	-69.2	24,251	15,366	-57.8	18,739	15,075	-24.3
55 - 59 years	4,775	3,455	-38.2	9,694	7,876	-23.1	8,416	6,568	-28.1
60 - 64 years	3,727	2,718	-37.1	7,089	6,484	-9.3	6,105	5,045	-21.0
65 - 69 years	2,390	1,689	-41.5	5,328	4,074	-30.8	3,747	3,005	-24.7
Over 69 years	2,124	1,091	-94.7	5,200	3,000	-73.3	3,371	2,269	-48.6

[1]Percentage change was calculated as $x_{81}-x_{61}/x_{81}$, where x = number of farm operators.

Source: Canada Grains Council, Statistical Handbook'82.

many Canadian and Prairie farmers have low and inadequate income levels. But it is not the case that all farmers are poor; when incomes of farmers (not farms) are considered, farmers fare reasonably well comparatively and Prairie farmers have fared very well since the mid-1970's. Part of the farm income problem has resulted from using farm income to measure farmer income and farm family welfare. The extrapolation from farm to farmer is inappropriate. Brinkman and others have shown that farmer income on commercial farms is considerably higher than traditional arguments suggest.[8]

The educational structure of farmers is difficult to document, and it is not likely to produce a complete picture even if such information were available. In the recent past there has been an improvement in the level of education of prairie farmers with significant numbers of university graduates at all levels (technical courses, degree courses and graduate programs) returning to farms. In addition, there has been a proliferation of private, public and university extension programs and short courses which take education to farmers throughout the year. As a result, the level of education and knowledge dissemination about farm businesses within the Prairies would exceed any statistical measures which might be produced by surveys such as the Census. The typical commercial farmer on the Prairies today has available a wide range of educational and management upgrading opportunities and he/she is taking advantage of them. Significantly, Bollman reported that farm growth was positively correlated with educational level.[9]

Finally, family farm issues will continue to be a major policy issue in agriculture as long as agriculture receives public attention. Farm numbers have declined, farm size has increased, farm units have incorporated, and some very large farms have come (and gone). However, the

basic structure of farm units on the Prairies remains family owned and family operated, and with a strong likelihood that the farm will remain in the family. Farm corporations are usually family corporations, and many of the large farms that may have a large number of hired employees are also family owned and operated units. Family farms have changed and evolved over the decades, but they are, and will remain, the predominant structural unit on the Prairies.

Our conclusion regarding the people resource, like that of several other resources for Prairie grains, is that people in their role as managers and operators will not constrain future development. Favorable changes have occurred in the human resource in the past decade, and the potential from the evolving farm population likely is greater than it has ever been.

Non-Farm Inputs

Earlier discussion argued that the Prairie land base provides some potential for expansion, but it is limited and primarily dependent on reduction of summerfallow. Significant growth, if it is to be achieved, must come from the existing higher quality, and lower risk land.[10] This further requires increased and improved use of the significant output increasing variable inputs, and further technological improvements in the production sector. The important variable inputs are fertilizers, pesticides, and seed varieties. Machinery, although not a variable input in the strict sense, is also important, because it facilitates and improves the use of variable inputs, and can significantly improve cultural

practices, moisture conservation and use. The major technological improvements have occurred in the areas of tillage practices generally, in the increased use of higher yielding varieties, and in improving the mix of crops cultivated to take advantage of yield and market opportunities. This section discusses the other major non-land inputs in the context of grain production change to 1990.

Variable Inputs and Productivity

Production of Prairie grains has increased substantially over the past decade in both volume and value terms, but the utilization of many inputs have also increased, in some cases far faster than output. For example, Figures 4 and 5 in the previous section showed that fertilizers and pesticides (and interest costs) increased more quickly than total production expenses. Figures 6 and 7 illustrate the large increases in the rates of application of fertilizer and pesticides on the Prairies after the low grain prices of 1969-71 turned upwards in 1972. Considering these concurrent increases in output and variable inputs, together with the modest increases in acreage and the larger, but variable, yield increases, a number of basic questions arise: what has happened to productivity during the 1960's and 1970's?; what have been the factors which have contributed to productivity improvement where it has occurred?; and, how can productivity improvement be assured in the future? In order to answer these questions it is not enough merely to examine yield increases. Yield increases per acre are not a very satisfactory measure of productivity--too many variables have changed to allow useful conclusions.

A study by Brinkman and Prentice[11] provides empirical estimates of changes in total productivity of western Canadian agriculture since 1961 (Figure 8). Their data show that the rate of total productivity increase

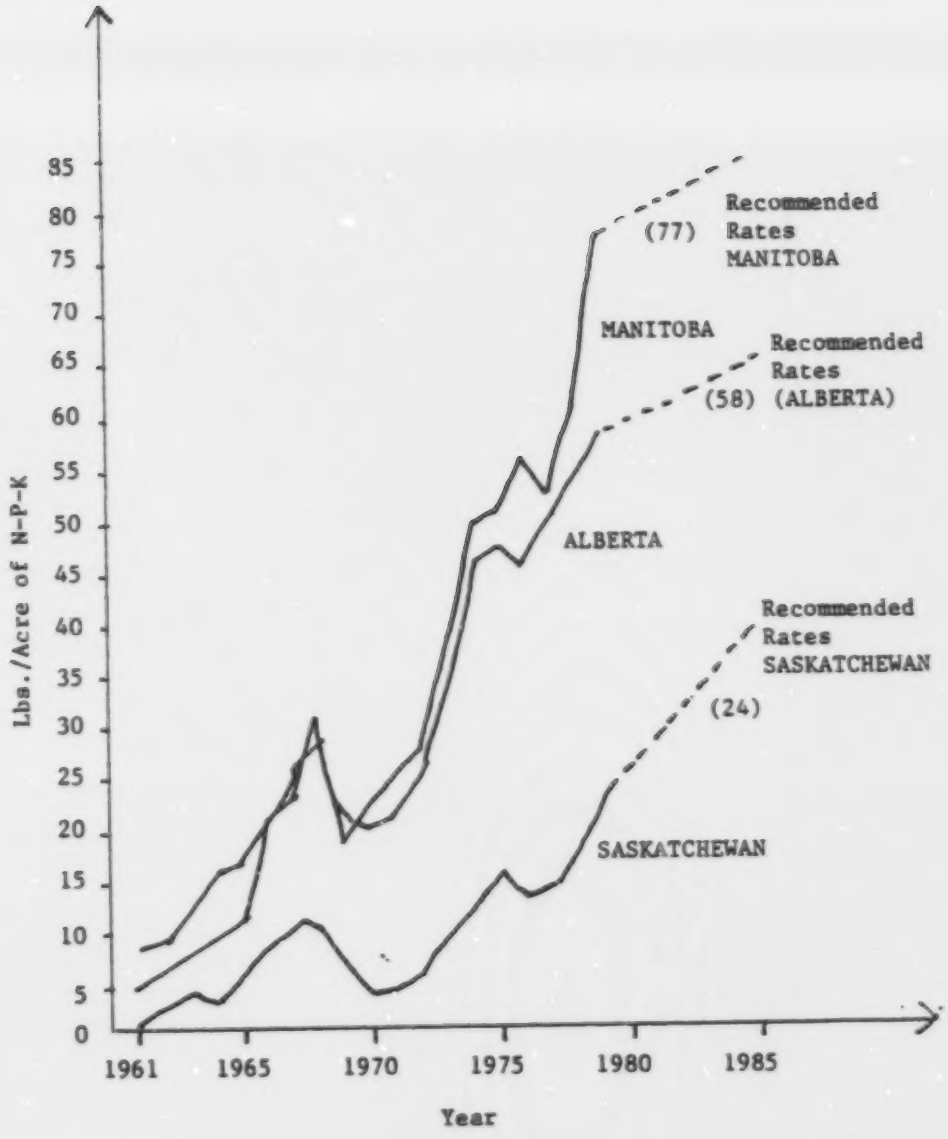


Figure 6

Prairie Provinces: Fertilizer Application

Source: Statistics Canada, Fertilizer Trade, Cat. No. 46-207, Annual 1960-1977.

Canadian Fertilizer Institute, Western Canadian Fertilizer Association Retail Sales, 1978/79.

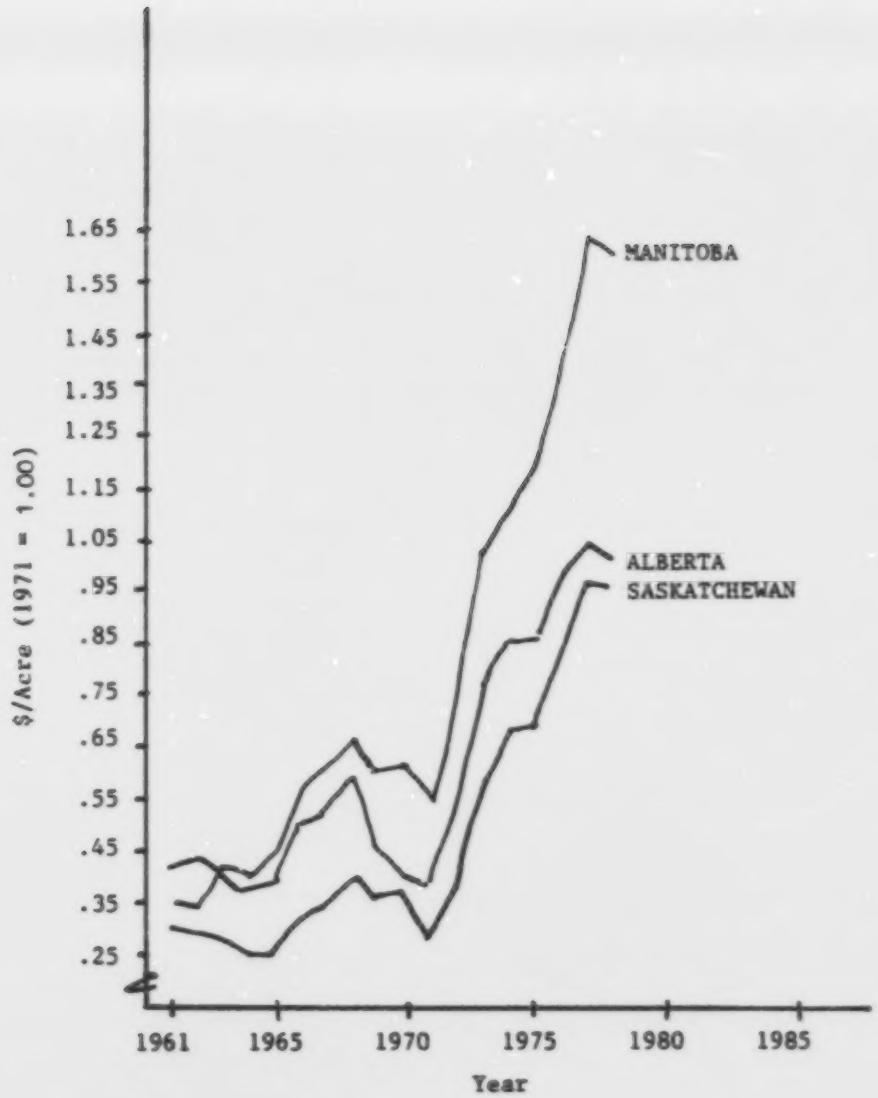


Figure 7

Real Pesticide Expenditures Per Seeded Acre
in the Prairie Provinces

Source: Statistics Canada, Farm Input Price Indices, Cat. No. 62-004, 1971-1979.

Statistics Canada, Net Farm Income, Cat. No. 21-202, 1961-1979.

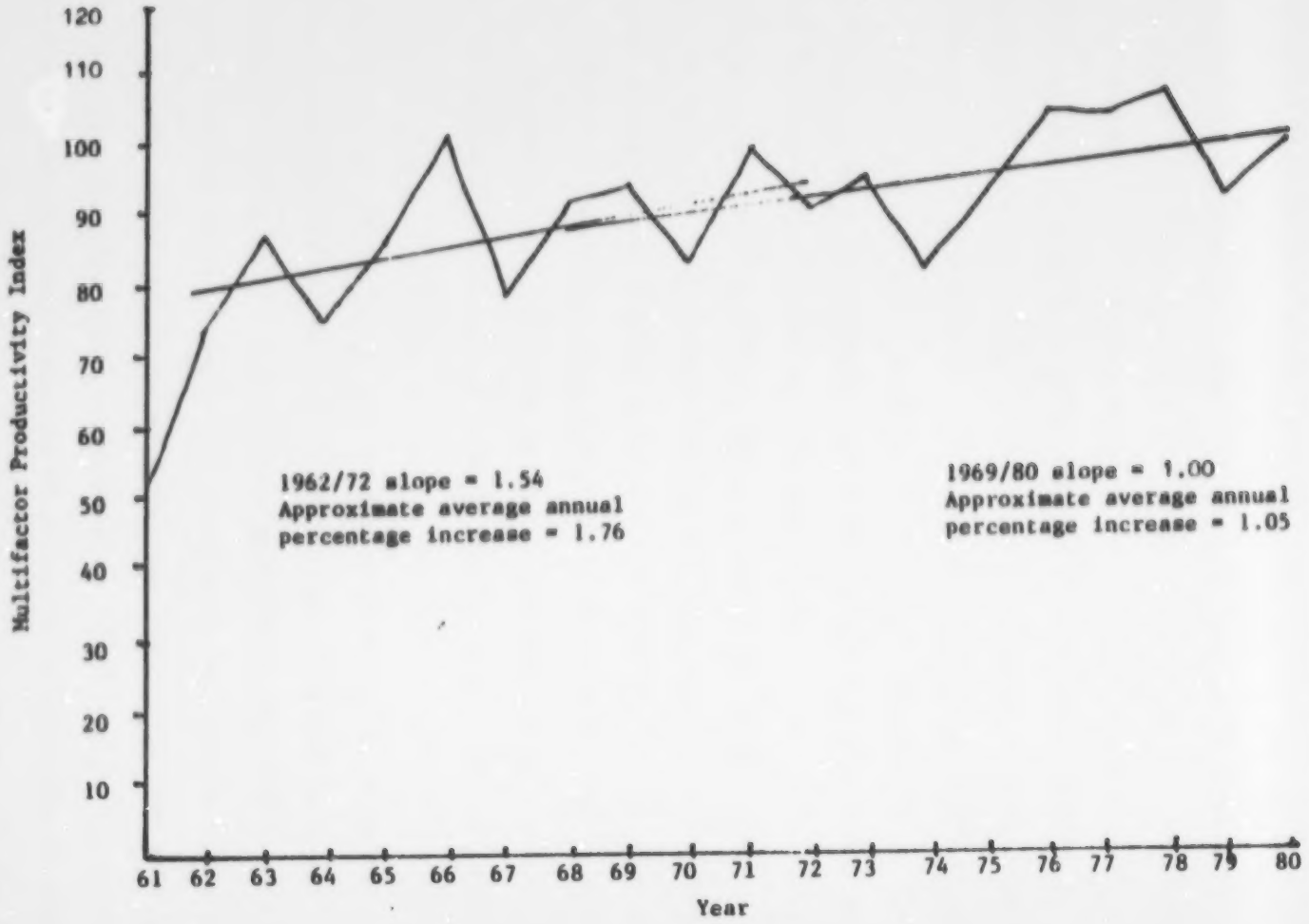


Figure 8

Trends in Multifactor Productivity Growth, Western Canada, 1961/80

Source: George L. Brinkman and Barry E. Prentice, Multifactor Productivity in Canadian Agriculture: An Analysis of Methodology and Performance 1961-1980 (Ottawa: Agriculture Canada, 1983).

declined between the 1960's and 1970's; it averaged 1.76 percent annually from 1961-72, and 1.05 percent annually from 1968-80. Corresponding figures for the two periods for eastern Canada were 2.16 and 1.18 percent.

The data cited here do not apply only to Prairie grains; the figures take into account both crops and livestock, and they refer to the western region rather than to the Prairies. Attempts to disaggregate the data to compute a comparable total productivity change for Prairie grains were unsuccessful. An alternative approach to measuring total productivity change is, however, reported in Table 19. The Indexes of Crop Production for each of the Prairie provinces, as given in Table 9, were deflated by cropped acreage to give the Index of Crop Production per acre. Although the measure is a very crude estimate of productivity change, it does reflect the change in the mix of crops and changes in yield, net of acreage changes. The data indicate that Saskatchewan had the slowest rate of growth between 1971 and 1982, while Alberta had the greatest growth during the same period. Grain production in Manitoba and Alberta increased by considerably more than the Canadian average, but exhibited more variability, due likely to the greater influence of weather on the Prairies.

Estimates of the contribution of new varieties to yield increases are provided in Table 20. The data provided are for the period 1958-76, and it is likely that conducting the analysis for the period since 1976 would alter some of the estimates. For example, since the mid-1970's, there have been significant new varieties adopted in wheat, feed barley, rapeseed and flax. Flax, in particular, has been improved in its production potential by as much as 20 percent since 1976. Such increases would rank flax between barley and rapeseed in terms of yield improvements.

Table 19

Index of Crop Production Per Acre
1971-1982
(1971 = 100)

	Manitoba	Saskatchewan	Alberta	Canada
1971	100.0	100.0	100.0	100.0
1972	84.1	85.0	111.3	85.0
1973	90.9	87.5	102.8	90.0
1974	65.2	75.0	95.8	85.0
1975	93.2	97.5	131.0	110.0
1976	103.0	125.0	142.3	115.0
1977	127.3	120.0	129.6	120.0
1978	127.3	120.0	139.4	120.0
1979	102.3	90.0	133.8	100.0
1980	89.4	95.0	164.8	110.0
1981	127.3	115.0	169.0	125.0
1982	143.6	122.4	163.4	130.0

Sources: Statistics Canada, Index of Farm Production, Cat. No. 21-203, 1971-1983.

Statistics Canada, Field Crop Reporting Series, Cat. No. 22-002, 1971-1983.

Table 20

Estimated Yield Contribution of New Varieties
for the Period 1958-1976

Crop	Manitoba	Saskatchewan	Alberta
	.....percent.....		
Wheat	5	6	4
Oats	2	4	4
Barley	12	10	16
Rapeseed	27	22	20
Flax	1	1	1

[1]Benchmark varieties: Wheat - Thatcher, Barley - OAC21, Oats - Harman, Rapeseed - Polish, Flax - Redwood (Black soils), Redwing (Brown soils).

Sources: J.D. Dyck, "The Impact of Adopted Technological Change on Farmland Prices in Manitoba," unpublished M.Sc. Thesis, February, 1979.

J.D. Nagy, and W.H. Furtan, "Economic Costs and Returns from Crop Development Research: The Case of Rapeseed Breeding in Canada," Canadian Journal of Agricultural Economics, Vol. 26, No. 1, February, 1978.

R.A. Hedlin, and L.R. Rigaux, "Crop Yield Changes in the Prairie Provinces 1958-1976," paper presented at the Manitoba Agronomists Annual Conference, 1976.

Clearly, these data are underestimates of the contribution of new varieties. When these facts are considered together with what is said later in this report about potential yield increases from relaxation of some of the requirements on export standards, it can be seen that new variety development is an essential component of Canadian grains development.

The Canada Grains Council has taken all of these factors, along with their projection of changes in the land base, to forecast yields, acreage and total production in 1990. Table 21 suggests that yield increases would be greatest in Manitoba, especially in flax, and that of the major crops, barley and rapeseed would experience the greatest increases. Wheat is projected to have the smallest yield increases. These increases are expected to be even smaller than those which could result from plant breeding improvement if the export standards were relaxed. The projections made by the CGC acquire a degree of credibility in the sense that most of the yields predicted have already been achieved or exceeded, several of them as early as 1976 and 1977. Moreover, since 1976, some new higher yielding varieties have been introduced in all the grains. On the other hand, each of the maximum yields already achieved was associated with extremely favorable weather conditions in the major areas of production. As a result, our view is that very favorable weather and marketing conditions would be required to <u>sustain</u> yields at these levels in 1990, and thus the Grains Council estimates may be on the high side. On the other hand, changes in export standards and the licensing of new varieties could increase wheat and barley yields by more than the projections. The most likely case is that yields will be somewhat less than those given in Table 21.

Table 22 presents the CGC projections for acreage in grains in 1990. These data project a 21 percent increase in acreage of all crops and in the

Table 21

Average Yields of Major Grains, 1977-1981, and Projections to 1990

Province and Crop	Weighted Average Yield 1977/81[1]	Projected Yield 1990[2]	Percent Increase In Yield by 1990	Highest Annual Average (to Date)[3]
	.....kg/hectare.....		%	kg/hectare
Manitoba				
Wheat	1,893	2,101	11.0	2,286 (1982)
Oats	1,933	2,399	24.1	2,350 (1982)
Barley	2,376	2,767	16.5	2,933 (1982)
Flaxseed	916	1,194	30.4	1,165 (1982)
Rapeseed	1,189	1,490	25.3	1,437 (1977)
Saskatchewan				
Wheat	1,766	1,905	7.9	2,094 (1976)
Oats	1,820	2,131	17.1	2,152 (1971)
Barley	2,211	2,567	16.1	2,605 (1982)
Flaxseed	980	1,070	9.2	1,158 (1982)
Rapeseed	1,196	1,339	12.2	1,429 (1977)
Alberta				
Wheat	2,047	2,209	7.9	2,295 (1981)
Oats	2,221	2,477	11.5	2,404 (1980)
Barley	2,524	2,949	16.8	2,729 (1980)
Flaxseed	1,171	1,336	14.1	1,383 (1981)
Rapeseed	1,164	1,411	21.2	1,295 (1981)

[1] Provincial departments of agriculture yearbooks.

[2] Canada Grains Council projections.

[3] Year recorded in brackets.

Sources: Canada Grains Council, Prospects for the Prairie Grain Industry: 1990, p. 40.
Canada Grains Council, Statistical Handbook '83.

Table 22

Areas Devoted to the Major Grains, Prairie Provinces, 1977 to 1981 and Projected 1990

Crop		Manitoba	Saskatchewan	Alberta	Total
		.....'000 hectares.....			
Wheat	1990	1,655	8,975	2,819	13,440
	1977-81	1,360	7,046	2,242	10,648
Oats	1990	205	350	445	1,000
	1977-81	275	494	595	1,364
Barley	1990	955	1,645	2,740	5,340
	1977-81	765	1,335	2,185	4,285
Flaxseed	1990	330	220	75	625
	1977-81	344	215	60	619
Rapeseed-Canola	1990	500	1,135	1,110	2,745
	1977-81	348	882	943	2,173
TOTAL--5 Grains	1990	3,645	12,325	7,180	23,150
	1977-81	3,092	9,972	6,025	19,089
TOTAL--All Grains	1990	4,140	12,640	7,400	24,180.
	1977-81	3,478	10,210	6,248	19,936

Source: Canada Grains Council, Prospects for the Prairie Grain Industry: 1990, p. 112.

five major crops. The increase in wheat acreage (over 30 percent) is the largest absolute and relative increase, implying that wheat would become even more important among grains. If this development did occur, it would change the pattern of growth of the 1960's and 1970's in which acreages devoted to barley and rapeseed acreages experienced the greatest growth. Again, because these projections tend to be more technically based, and do not consider the overall market environment, we suggest they may overestimate future values. We do, however, accept the distribution of acreage increases among the grains.

As a result, we expect that the total production projections in Table 23 are also overstated. The data indicate an increase in total production of almost 38 percent relative to the 1977-81 average, which itself represented a significant increase relative to the production totals of the 1970's. A sustained annual rate of increase of over two percent would be required to reach the 1990 production projections of the CGC, with the underlying requirement of favorable weather conditions, and a favorable market environment. There is little doubt that this rate could be achieved or exceeded under ideal conditions, but for reasons offered throughout this study, we doubt that such conditions will exist. The limitations imposed by the international market with respect to both size and price variables and the present domestic regulatory environment are the primary reasons for our reservations.

Machinery and Equipment

Machinery and equipment expenditures are one component of the modernization process which has occurred in Prairie grain farming, but such expenditures do not adequately indicate what has really occurred. There has been a virtual revolution in the mechanization of Prairie agriculture

Table 23

Production of Major Grains on the Prairies,
1977/81 (Actual) and 1990 (Projected)

	Manitoba		Saskatchewan		Alberta		TOTAL	
	1977/81	1990	1977/81	1990	1977/81	1990	1977/81	1990
	.....000's tonnes.....							
Wheat	2,575.0	3,479.5	12,324.4	17,105.5	4,557.0	6,371.3	19,456.4	26,956.3
Oats	524.4	493.0	853.2	747.7	1,272.0	1,103.2	2,649.6	2,343.9
Barley	1,798.5	2,648.6	2,952.3	4,256.7	5,478.0	8,076.6	10,228.8	14,981.9
Flax	315.6	392.5	210.1	233.8	69.9	100.0	595.6	726.3
Canola	418.9	746.5	1,047.4	1,521.3	1,182.3	1,559.0	2,648.6	3,826.8
TOTAL	5,632.4	7,760.1	17,387.4	23,865.0	12,559.2	17,210.1	35,579.0	48,835.2

Source: Canada Grains Council, Prospects for the Prairie Grain Industry 1990, p. 114.

since the early 1970's. In addition to being larger and more powerful, the equipment is considerably more convenient and precise in operation. Newer equipment not only facilitates the application of fertilizers and pesticides and other variable inputs, but also provides some potential for energy saving and can contribute to significant reductions in labour requirements. Electronics, including on-Board computers, are used on most modern field crop machinery from seeding through to harvesting and grain handling. The potential for electronic support of machinery and equipment in grain production is limitless. When these facts are considered in conjunction with the improved grain handling and drying systems which are being used, the improved machine storage and repair facilities which are available, and the tighter farm management practices which are being followed, it can be seen that the Prairie grain sector has very quickly evolved into a form of industrialized business operation. This evolution represents a major set of changes in less than a decade. These changes have affected the speed and timing of field operations, the quality of grain produced, the efficiency of input utilization, and should have improved overall technical efficiency.

Whether overall economic productivity will improve from these changes is unclear, although the potential is there. These changes have come at high cost, and some observers would argue that they have been initiated by machinery manufacturers and facilitated by tax laws. Identifying the impacts of these changes is difficult because many of them show up in indirect ways (less dockage in grain, slightly better quality because of less weather damage), and some impacts may be distributed over time (less fuel consumption per acre, better use of fertilizer through changing application methods). In addition, these changes will be masked

by the tendency of Prairie agriculture to overcapitalize in equipment, but it is also this tendency for overcapitalization which allows many producers to survive prolonged periods of financial stress when markets are soft or production problems occur. The balance sheet on these factors does not appear to have been analyzed, and it may not be capable of concrete economic evaluation. What is reasonably certain, however, is that the production base in Prairie grains as it relates to mechanization has evolved in the past decade. Furthermore, it does not appear that mechanization will be a constraint to Prairie grains development.

Research

The previous discussion has indicated some of the contribution of technological change to grains production. It has also established that there remains potential on the Prairies for further growth in production. Technological advancement, of course, originates with some form of research effort. In Prairie grains, probably more than in the rest of agriculture and more than in most Canadian industry, a great deal of the research effort must be tailored to Prairie conditions. Climatic conditions, growing conditions, soil characteristics, and export standards for grains require that advances in varieties, fertilizer and pesticide use, tillage practices, etc., be researched on and for the Prairies, or particular areas within them. As a consequence, the research needs are not only substantial, but also specific.

The role and status of grains research on the Prairies has been summarized recently by Veeman and Veeman[12]; we refer readers to their discussion rather than attempt to reproduce it. Briefly, they state that agricultural and grains research is dominated by public funding, that it has had a high rate of return, and that generally it appears to be under-funded and understaffed. They note as well, a point made by the Economic

Council in 1969, that grains research appears to be underemphasized given the importance of grains in the Canadian economy. The same points are made in the context of biotechnological research in varieties development by Loyns et al.[13]

It is difficult to argue with these points and we will only suggest three additional items. First, the availability of published economic research on grain markets and marketing is extremely limited, and funding sources for such research are inadequate. Secondly, within grains research (economic or technical) an allocation procedure for research funding based on the demand characteristics of the commodity should be examined.[14] Carter has pointed out that output increasing research for internationally traded commodities will generate more domestic benefits from commodities which have higher demand elasticities than those which have lower demand elasticities. In general, this would imply more emphasis on rapeseed and special crops than on cereals, and probably more research on barley rather than on wheat. In the case of wheat, it would imply more reseasrch effort on high yielding lower quality varieties including feed wheat.[15]

The third area of concern with grains research involves the possible introduction of plant breeders rights (PBR). Legislation has been before the House of Commons for several years which would provide for patent protection to plant breeders. A major motivation for the legislation is that it would provide incentive for private sector funding of varieties research and development. When all the rhetoric about the hazards and advantages resulting from the introduction of PBR are stripped away, there is no evidence to show that private research and development will be significantly increased by their introduction, and there are some reasons to expect that they will not produce this result in Canada.[16] Also of impor-

tance in this issue is the possibility that the Federal government might use PBR as a reason to reduce the priority of public funding of plant research. This result, if it were to occur, would almost certainly reduce Canadian cereal and grains productivity, and production. Our conclusion is that public funding of grains research, including marketing research, is needed and would continue to generate high rates of return. Ways also need to be found to increase private funding; fertilizer and pesticide manufacturers, feed manufacturers, the elevator companies, the CWB, and farmers themselves should be viewed as potential contributors to grains research.

FOOTNOTES

[1]Prairie Farm Rehabilitation Administration, Land Degradation and Soil Conservation Issues on the Canadian Prairies: An Overview, (Ottawa: Prairie Farm Rehabilitation Administration, 1982).

[2]Canada Grains Council, Statistical Handbook '82, (Winnipeg: Canada Grains Council, 1983).

[3]Canada Grains Council, Prospects for the Prairie Grain Industry 1990, (Winnipeg: Canada Grains Council, 1982).

[4]Daryl F. Kraft, "Land Use Strategy for a National Food Policy," R.M.A. Loyns, ed., Proceedings of FORUM on National Food Policy, Occasional Series No. 11, Department of Agricultural Economics, University of Manitoba, 1978.

[5]R.A. Hedlin and L.R. Rigaux, Crop Yield Changes in the Prairie Provinces, 1958/76, Manitoba Agronomist Annual Meeting, 1977.

[6]PFRA, op. cit., p. 77.

[7]Fortunately the literature on farm income analysis has begun to flourish in recent years. Cf. the bibliography provided in George Beelen, "An Alternative System of Financial Accounting for the Canadian Agricultural Production Sector." M.Sc. Thesis, Department of Agricultural Economics and Farm Management, University of Manitoba, July 1983.

[8]G.L. Brinkman, Farm Income in Canada. (Ottawa: Economic Council of Canada and Institute of Public Policy, 1981).

[9]Ray D. Bollman, A Preliminary Micro-Analysis of Farm Firm Growth," Working Document, Statistics Canada, July 12, 1983.

[10]This conclusion was also reached by the Canada Grains Council. See Prospects for the Prairie Grain Industry 1990, p. 36.

[11]George L. Brinkman and Barry E. Prentice, Multifactor Productivity in Canadian Agriculture: An Analysis of Methodology and Performance 1961-1980. (Ottawa: Agriculture Canada, 1983).

[12]Terry Veeman and Michele Veeman, The Future of Grain. (Ottawa: Canadian Institute for Economic Policy, 1984), pp. 104-110.

[13]R.M.A. Loyns, Colin A. Carter, M. Kraut, W. Bushuk, J.R. Jeffrey and Z. Fredown Amadi-Esfahai, Constraints to Biotechnological Developments in Canadian Grains with Special Reference to Licensing of Varieties. Research paper prepared for the Science Council of Canada, April, 1984.

[14]Colin Carter, "Agricultural Research and International Trade," paper presented at the University of Lethbridge Conference on Research in Agriculture, Lethbridge, Alberta, September 1983.

[15]Loyns et al., op. cit., Ch. 5.

[16]Loyns and Begleiter. An Examination of the Potential Economic Effects of Plant Breeder Rights in Canada. (Consumer and Corporate Affairs, Canada, Ottawa: August 1984).

IV. THE INSTITUTIONAL, POLITICAL AND REGULATORY FRAMEWORK

Introduction

Compared with other major grain exporting nations, the Canadian grain marketing system is very heavily regulated by the Federal government. The regulatory framework has evolved over the past eight decades and has had several objectives: to assure the quality of Canadian grains in export, to provide bargaining power and equity to producers, to facilitate marketing, and to appease special interest groups in the domestic grain market. Regulations which have the greatest economic impact on the market include grain freight rates (originally fixed, now changing), producer delivery quotas, rail car allocation, corn formula prices for domestic feed grains, buying and selling privileges of the CWB, and grain licensing and grading. One characteristic of regulations in the grain industry is that they are very sticky; once in place they tend to remain, even if they were only meant to be temporary.

This chapter describes the major government regulations which affect the production and marketing of grain in Canada. The focus will be on identifying the role regulations will play in the future development of the grain industry in Canada. To begin, a brief descriptive overview of the institutions will be provided, followed by a discussion of the important effects of regulations.

There is considerable interdependence among the Canadian Wheat Board (CWB), the open market, and the regulators in the grain marketing system. For example, regulations which apply to the CWB grains will often directly and indirectly impact heavily on open market grains. Also, these linkages become more complex when the CWB acts as both the regulator and the

regulated party. Thus, discussion in this chapter will recognize this interdependence and the general model depicted in Figures 9 and 10 will provide a framework for the analysis.

Institutions and Regulations

There is a very intricate mixture of government, co-operative and private enterprises in the Canadian grain markets and for this reason it is a very complicated system. A full description of the role of the major institutions is beyond the scope of this chapter and the interested reader is referred to the Canadian International Grains Institute[1] and/or McCalla and Schmitz,[2] for an interesting discussion of the differences between Canadian and U.S. institutions. Most of the major Canadian institutions are government agencies while many of those in the U.S. are privately owned, or cooperatives.

Grains are marketed in Canada through one of three channels: the CWB, the dual CWB-open market system, or the open market. For some types of grain only one channel is available for marketing while for others producers have a choice. For example, wheat, oats and barley for export must be delivered to the CWB while both the CWB and privates companies sell in the domestic feed market. Special crops are strictly open market commodities.

Canadian Grain Commission (CGC). The government regulatory agency which is responsible for the quality control of Canadian grain and for the supervision of its handling is the CGC. The Commission operates under the authority of the Canada Grain Act (1909, amended 1971), and one of the most important of its functions is the inspection, grading, and certification of grain sold commercially in Canada and for export. The official inspection of grain is done on a visual basis and any new variety licensed for

Figure 9

Organization of Western Canadian Grains Marketing

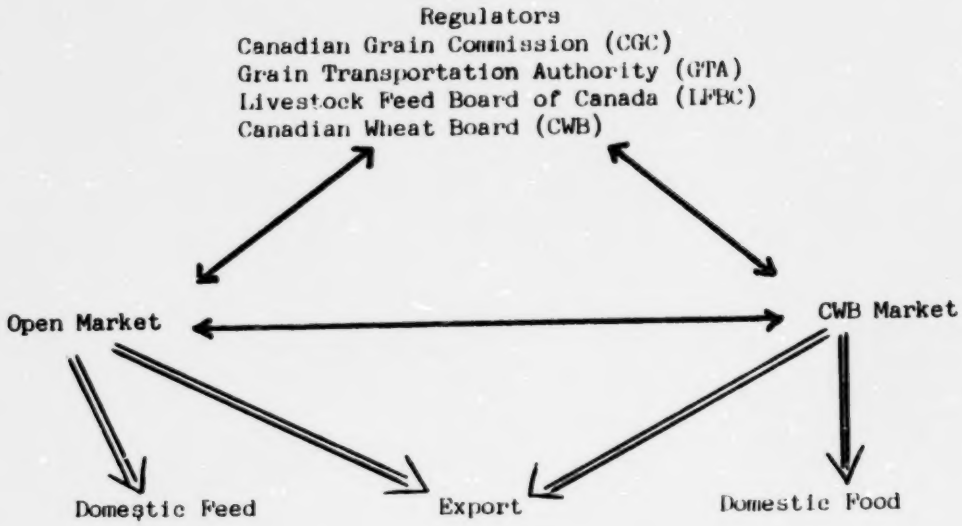
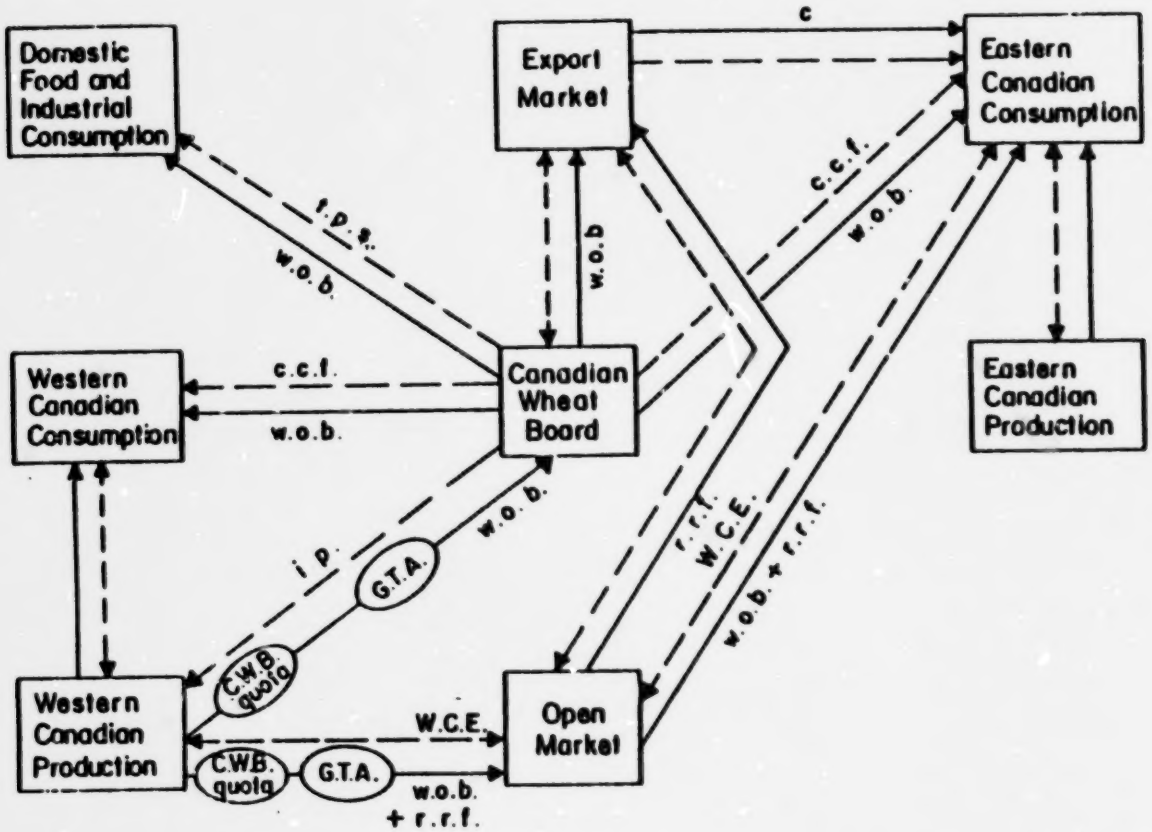


Figure 10

Major Structural Links in the Canadian Grain Markets



Legend:

Volume - ⟶
Price - ⟶
⬭ - Regulator
t.p.s. - two price system
c.c.f. - corn competitive formulae
i.p. - initial payment

G.T.A. - Grain Transportation Authority
C.W.B. - Canadian Wheat Board
W.C.E. - Winnipeg Commodity Exchange
w.o.b. - wheat, oats and barley
r.r.f. - rye, rapeseed and flaxseed
c. - corn

Source: C.A. Carter, "The System of Marketing Grain in Canada," in Grain Marketing Economics, edited by G.L. Cramer and W.G. Heid Jr., John Wiley and Sons, 1983, p. 304.

production must be visually distinguishable from any other variety in a similar grade category. The CGC has historically stressed the quality of grain production which has resulted in some loss in quantity produced. The economics of this trade-off between quality and quantity of production has only recently been subjected to analysis and it appears that the existing regulations may be reducing output and returns to western grain producers.[3]

Canadian Wheat Board (CWB). The CWB is an agency of the Government of Canada and is primarily a centralized sales agency as it owns no physical facilities for the handling of grain. As set out in the Wheat Board Act of 1937 (amended 1967), its major objectives are:

1. to market wheat, oats and barley delivered to it within the Wheat Board area in order to maximize producer returns;
2. to provide producers with initial payments which are established and guaranteed by the federal government;
3. to pool selling prices for the same grain so that all producers get the same basic return for grain of the same grade delivered within the crop year; and
4. to equalize deliveries through quotas so that each producer gets his fair share of available markets within the crop year.[4]

For the three grains it handles, the CWB has monopoly rights over both exports and domestic sales for human consumption. The CWB also has responsibility for establishing quotas on deliveries of flax, rapeseed and rye to the traditional grain handling and transportation system. This authority is justified by the requirement to ensure equity in space allocation, but it obviously provides the CWB with a significant degree of control over these commodities.

The CWB also had monopoly selling privileges for all interprovincial feed grain movement from the late 1940's until 1974. The Canadian

government changed the feed grain policy in 1974 which freed up some aspects of the system and created a dual marketing system for feed grains. This allowed for domestic sales of feed grain either through private (e.g., Cargill, Continental, N.M. Patterson, Pioneer) or co-operative (e.g., United Grain Growers, Alberta Wheat Pool, Saskatchewan Wheat Pool, Manitoba Pool) grain companies or through the CWB. A small amount of domestic feed grain currently moves interprovincially by direct producer shipments. To facilitate the open market, futures trading in feed barley, feed wheat and feed oats was started on the Winnipeg Commodity Exchange (WCE) in 1974. The private and co-operative grain companies trade actively on this market, with the co-operatives being the major participants since they dominate grain handling in western Canada.

Grain Transportation Authority. The Grain Transportation Authority (GTA), one of the newer regulatory bodies, was established in 1980 and was given the sole responsiblity for the allocation of railcars for the movement of grain, which was formerly handled by the CWB.

The GTA's two major responsibilities are to fairly allocate the available grain cars between the CWB and the companies handling open market grains, and to co-ordinate the temporal and spatial allocation of grain cars.

As an intermediary between the grain industry and the railways, the GTA, in consultation with the railways, determines the total cars available for country loading on a weekly basis. Once the stock of grain cars has been established for the week, the GTA analyzes the position statements and sales commitments for the grain companies and the CWB. Open market requests for cars for oilseeds and rye are based primarily upon sales commitments and stocks in export position. Cars for open market feed

grains are initially made available on the basis of feed grain receipts by the primary elevators rather than sales to the domestic market. An informal guideline of 10 percent of the available weekly grain car supply is allocated to the open market movement of feed grains. Once the initial allocations to the CWB and open market grains have been made, cars are assigned to individual grain companies to move open market grain. Once the CWB receives its initial allocation, the cars are assigned by the CWB to individual grain companies holding grain owned by the CWB. The CWB develops loading plans for both Board and open market grain on the basis of shipping blocks. This last step in the allocation procedure is carried out by the CWB and the railways. They assemble car orders into train runs and the orders are placed with elevator managers for shipment. Between the time that the initial allocation to Board and non Board grains are made and the final loading plans for Board and non Board grain are drawn up, one week elapses. Differences between the initial and final allocation occur, because some preliminary allotments must be revised. During the past few years, many of the revisions involved allocation of cars for feed grains.

An investigation into alternative car allocation procedures was conducted by IBI Group/Theo Joseph Inc. in 1981.[5] The basic finding of the study was that the GTA has improved efficiency in the allocation of rail cars and that further improvement is both necessary and possible. The relationship and lines of responsibility between the GTA and CWB in the extremely important marketing function are, at times, unclear, and the gains that have been achieved by the existence of GTA since 1980 appear to hang on a relatively delicate political balance.

Winnipeg Commodity Exchange (WCE). The WCE is both a cash and futures market and is the oldest institution in Canada's grain industry. It is a marketplace where open market grains are traded and the cash and

futures prices established serve as a reference point for almost all of the open market grain which trades in western Canada. The WCE is a self-regulating institution, but, beginning in 1976, one employee of the CGC is delegated to monitor the operation of the Exchange under the Grain Futures Act (1939).

Commercial participation in the open market is made up primarily of farmer owned co-operatives and privately owned grain companies. These companies operate primarily as middlemen in the domestic grain market. Due to the regulated structure of the Canadian market, they have numerous regulations and constraints to cope with such as quotas, administered prices and handling charges, car allocations, etc.

The open market sales of feed grains are for domestic consumption only. Rapeseed, flaxseed and rye are also traded through the open market and because these crops are not handled by the CWB, they area marketed in both domestic and international channels by the grain companies. A producer plebiscite in the early 1970's rejected the marketing of rapeseed through the CWB. Although feed grains, rapeseed, flaxseed, and rye may be marketed on the open market, the marketing of all six grains is controlled to a certain extent by the setting of their delivery quotas by the CWB.

The only true open market grains in western Canada are the specialty and forage crops. These include soybeans, corn, fababeans, sunflowers, lentils, canary seed, mustard, peas and forage seed. There is no centralized marketplace in Canada which determines prices for these crops. Producers generally market these crops through grain companies without quotas constraints, and, except for soybeans and corn, these products are exported.

Another component of open market sales is the amount of feed grain marketed outside of the licensed elevator system. These sales account for about 30 percent of Prairie grain production and represent on-farm usage, farm-to-farm and farm-to-feedlot sales. Generally, the WCE price is used as a reference point for pricing in this market.

Some Economic Effects of Grain Regulations

Statutory freight rates. Rail rates for western Canadian grain transportation were essentially established in 1897 when the Canadian Pacific Railway (CPR) and the Government of Canada signed the Crow's Nest Pass Agreement. As a result of these fixed statutory rates, the railways have claimed that they have earned insufficient revenues for hauling grain for the past 20 years. The Snavely Report[6] estimated a railway shortfall, the difference between the cost and revenues from moving grain, of $612 million in 1981. As a result of railway losses, the grain rail system deteriorated rapidly during the late 1960's and 1970's, and serious problems in grain movements followed. For example, the CWB estimated that $1.1 billion in grain sales were either lost or deferred in the 1977-79 period alone, due to inadequate and inefficient transportation services. During this period, the build-up of on-farm stocks of both wheat and barley was rapid indicating there were real transportation problems. As a result, during the 1970's the Canadian government began negotiating with railways, farmers, elevator companies and farm groups to rationalize the grain transportation system and to gradually deregulate some components of the system. In 1983, the legislation to change the Crow rate and upgrade western grain transportation (The Western Grain Transportation Act) was finally passed by the House of Commons. As of August 1, 1983 grain freight rates will begin to move upwards.

For a thorough discussion of the economic impacts of the Crow's Nest rates and their removal, see Harvey.[7] The basic premise of Harvey's analysis (and others) is that the Crow rates represent a direct subsidy to farmers in western Canada which is paid by railway shareholders and Canadian taxpayers. Harvey believes that the rates should be changed to compensatory levels and that western grain producers should be compensated up to the net present value of the subsidized freight rates. However, his analysis does not recognize that a large part of this subsidy may be captured by importing nations, or that the crow freight rates have also been a burden to grain producers since low revenues have hampered the ability of the railway system to move Canada's grain into the export market. Changing the statutory rates to compensatory levels will not necessarily lower farmers' realized grain prices to the extent estimated by Harvey. At least one analysis suggested net farm incomes could actually increase by raising grain freight rates as long as greater volumes of grain were moved.[8]

The future rationalization of grain freight rates will likely have a significant impact on western grain production, processing, transportation and trade. In many cases, the magnitude of the changes, and in some cases even the direction of change, is unclear. There is no doubt that the on-farm price of grain at any point in time will decline with increased transportation charges. However, what happens to producer net returns depends upon the mix of production, volume of sales, and average annual prices. Our view of the direction of change in producer net returns is positive, but the magnitude and specifics are uncertain. It is our view that western grain production and exports could increase with a rationalization of the system since the "Crow rates" have resulted in

serious resource distortions and periodic accumulations of on-farm stocks of unsold grain. In this respect, the Crow rates displayed characteristics of a tax on efficient production in addition to any subsidy benefits that may have been available.

Delivery quotas. Producer delivery quotas are another important sets of regulations which apply to the six major grains produced in Canada: wheat, barley, oats, rye, rapeseed and flaxseed. The CWB regulates producer deliveries to primary elevators through quotas on both Board and open market grains. Quotas in one form or another have been in place since 1940. Part of the requirement for quotas has resulted from a lack of rolling stock to move grain, because the railways were underpaid.

The major significance of the quota system in the context of this study is that it serves to restrict production in several ways. Grain producers are each assigned base acreage, whether the land is seeded or not. Producers allocate this base acreage among the six different grains as they desire, and quotas are announced by the CWB as a fixed number of bushels per assigned acre for each grain. No allowance is made for varying yields across the Prairies.[9]

There has also been some concern that the delivery quotas give the CWB undue regulatory power over which open market grains and oilseeds are produced and delivered. Recently, quotas were particularly restrictive in the 1968-71, 1977-79, and 1982-83 periods, and thus farmers were forced to carry burdensome on-farm inventories.

During the 1974-79 period, there were no quotas on open market feed grain deliveries, but elevator companies were subject to feed grain space regulations. These regulations stipulated that feed grains could occupy no more than 10 percent of a company's total capacity and a maximum of 20 percent of the capacity at any individual elevator. Even with these

restrictions, the regulations did provide for a reasonable free flow of grains in the market, and enabled the individual producer to make his own marketing choice. Upon recommendation of the Quota Review Committee (a subcommittee of the Producer Advisory Committee to the CWB), the CWB placed quotas on all domestic feed grain sales effective August 1, 1979. Since then, open market feed grain quotas have been relatively high compared to CWB quotas. As a result, they have not restricted aggregate flows of grain into the open market, but their implementation results in less-than-free-choice market decisions by Prairie grain producers. For the producer, there is a penalty attached to open market deliveries due to the fact that open market and CWB quotas are not treated independently.

An argument can also be made for the complete removal of all open market quotas (feed grains, rye, rapeseed and flaxseed) because the economic rationale behind these quotas is weak. To use feed grains as an example, quotas clash with the proposed objectives of the feed grain policy. The objectives of the policy, as outlined by Groenewegen,[10] include: "...for the efficient pricing of Canadian feed grains; and encourag(ing) the growth of livestock and feed grain production across Canada according to comparative advantage." The latter objective stresses crop production according to the theory of comparative advantage and this implies specialization in production. Quotas on open market grains have encouraged the opposite, and possibly inefficient, trend. The tremendous growth in the production of corn and special crops on the Prairies during the 1970's is evidence of this trend towards farm diversification rather than specialization. One of the major reasons this phenomena is taking place is that it allows farmers to avoid open market quotas or at least to spread the uncertainty of quota levels among crops. For example, growing

soybeans and corn in Manitoba does not likely comply with rational comparative advantage decision making, but it gives the producer a relatively larger base acreage for his quota grains and allows him to spread the risk of unknown delivery quotas. Similarly, many producers still summerfallow to spread a given anticipated production level over the quota base.

One popular argument put forth by proponents of open market quotas is that they serve to ration limited transportation and handling facilities. However, the GTA has been given the responsibility of allocating transportation resources so one must question why quotas are required for the same purpose. Furthermore, if quotas on open market grains are necessary (even though they are redundant), it would seem more appropriate if they were governed by a "third party" regulatory agency such as the GTA.

The long term solution to the quota problem is to reduce handling and transportation bottlenecks to the point where open-market quotas would be totally unnecessary. The seasonality of grain production and the overall costs of achieving that goal suggest that this is unlikely to occur but the present system could be modified to reduce the distortions presently occurring.

Canadian Wheat Board price pooling. Canadian farmers receive a pooled average price for grains sold to the CWB within each crop year, August 1 through July 31. The Government of Canada, in consultation with the CWB, establishes initial prices for all grades of each grain under Board authority. Producers receive the initial payment at the time of delivery and, in some years, an interim payment during the crop year. The final payment is received about six months after the pool is closed, usually in January of the next year. This means that grain planted in May

of this year, harvested this fall, and sold up until the following July, is not fully priced until January of the next year--a total elapsed time of about 18 months. All producer deliveries within a given crop year are pooled although the CWB will usually include sales beyond August 1.

Four weaknesses of the Canadian system of price pooling are:

1. price signals are very poor at planting time;
2. once a planting decision is made there is considerable risk that the final price received will be different from that expected at planting time;
3. the final price is not known until after a second crop has been planted and harvested; and
4. because short term price movements do not affect them, many farmers are ignorant of market prices.

The impact of pooling on the grain market is not as great as some of the other regulations considered in this chapter; nevertheless, it is important. In general, the price signals for Board grains are severely masked by pooling.

The major effects of pooling on the grain market are that it discourages production of grains according to comparative advantage, and that it adds unnecessary uncertainty to the market when the policy framework for setting initial prices is not clearly defined, and when interim payments are made irregularly.

The first of these two effects results from the fact that sales from the east and west coast markets are pooled together. This tends to distort spatial prices within Canada and thus affects resource allocation and crop production. Alberta barley production, in particular, is likely discouraged by price pooling. From 1974 through 1981, the average prices

of barley at Portland was approximately $.45/bushel higher than at Duluth. It this is an indication of the "west coast premium" which might exist in Canada in the absence of pooling, it indicates the extent to which Alberta barley producers are penalized because of the pooling of export prices in the east and west. Pooling, therefore, results in a disincentive to produce barley and an incentive to increase the area seeded to wheat, canola, and other crops. This distortion, along with the statutory grain rates when they existed, conflict with the feed grain policy objective of encouraging the growth of livestock and feed grain production across Canada according to comparative advantage, and reduce overall productivity in the grain industry.

Another form of this same distortive effect is found in protein grading of wheat. Despite the Canadian claim to high quality wheat, prior to the 1981-82 crop year different protein levels were not rewarded at the producer level even though they were known to exist.[11] Since August 1981, protein differentiation has occurred at the producer level, but only on the top grade of wheat, with only a very nominal premium being paid if the protein content exceeds 13.5 percent. At the sales end, both domestic and international sales are made on the basis of several protein categories and on both #1 CW and #2 CW grades. The impact of the pooling application here is that market signals are masked and areas which can produce higher protein wheat, or management practices which contribute to higher protein wheat, are discouraged, whereas areas less suited to high protein wheat are encouraged to produce. The impact may be relatively small in individual cases, but overall it could produce another significant production (quantity and quality) distortion.

Turning to the second effect of pooling, it seems the setting of initial prices by the CWB and the Canadian government is to a certain

extent "ad hoc." In 1981, for example, they were not even announced prior to planting. In order to increase both the quantity and quality of information to the producer, the setting of initial payments would have to follow stricter guidelines and interim payments would have to be made more often. Relating back to the feed grain policy objective... "to provide for the efficient pricing of feed grains," a more standardized approach to initial and interim payments would help to meet this objective. Steps have been taken by the Australian Wheat Board to combine pooling with hedging to improve the information flow to producers. This is an important move since an economically efficient market is unattainable without a continuous flow of information.

A final aspect of pooling relates to the time dimension of products and storage costs. Since quotas are generally reasonably uniform across the entire Wheat Board area, higher productivity areas (including low or zero summerfallow areas) require longer to move their total production and may experience higher carryover. This results in a lower net (annual) price for their product since there is no payment for storage, thus discouraging production of Board grains relative to alternative cash crops. In this way, selection of crops on the basis of natural comparative advantage is circumvented, and in some areas summerfallowing is encouraged.

Corn competitive formulae (c.c.f.). From the time of their inception (1976) until mid 1979, the formulae prices were basically irrelevant, because they were generally above world feed grain prices. Little grain was sold at the formulae prices and they did not impinge on price determination in the open market. The 1976 to 1979 period was, for the most part, a period of depressed world feed grain prices. However, during the 1980-81 period, world feed grain (and in particular, barley)

prices strengthened and the formulae constrained the levels which domestic open market prices were allowed to reach. For a thorough economic analysis of the formulae see Kraft.[12]

The CWB has to stand ready to sell feed grains within Canada at corn competitive formulae prices. Almost all domestic sales, therefore, take place at or below this price, because a domestic user would not normally bid more on the open market if feed grains are available from the CWB at the formula price. Since 1976, under the corn competitive formula, feed barley has been priced from $20 under to over $70 above the CWB asking export price and thus the formula price has shown little relationship to the export price. When the formula results in feed grains prices below the export price, the opportunity loss to western grain producers is substantial. They not only suffer due to the subsidy they are forced to provide through the c.c.f., but they also lose export opportunities for the feed grains as a result of the overconsumption occurring domestically because of artificially low prices.

To summarize, the corn formulae fix domestic CWB sale prices, influence the open market price, and from time to time undervalue domestic sales. With this combination of characteristics, it is clear that market signals are further distorted in the domestic feed grain market, which results in the production of another level of market uncertainty and the discouragement of feed grain production in western Canada. The removal of the formulae would improve market signals and, therefore, resource allocation.

Rail car allocations. In 1979, the GTA was appointed by the Federal government in order to improve co-ordination in grain handling and transportation, and to make more efficient use of terminal capacity. The GTA appears to operate in a rather confusing milieu involving the elevator

companies, railways, terminals, CGC and CWB, with its lines of authority not clearly defined. Prior to appointment of the GTA, transportation (i.e., car allocation) was administered solely by the CWB, with the exception that the CGC allocated (and still does allocate) producer cars.[13] While the operation of the GTA is not without problems, two aspects of this recent change in car allocation procedures deserve attention. First, since GTA entered the regulatory picture, there has been much more public debate and information on how this fundamentally important task is performed. There appears to be considerable agreement among industry participants that progress has been made toward improving transportation and elevator capacity co-ordination, and the data support this proposition. Secondly, there is an indication of greater confidence in the allocation process since it has been partly removed from CWB control. Presumably, the two aspects are not unrelated; the cloud of secrecy surrounding so much of the CWB's operation has always generated suspicions. To the extent that each of these factors contributes toward a more efficient transportation system, the GTA would appear to have provided for at least one important aspect of moving grains in the 1980's, provided the achieved results can be maintained.

Canadian Grain Commission. The regulatory impact of the CGC on grain markets is extensive. Some of the actual or probable effects of these regulations are discussed in this section.

It has been observed that some CGC regulations result in less competitive handling of grains and reduce improvements in handling efficiency or productivity. Two aspects of CGC regulations are identified in this context. The first is probably of considerable significance--setting of maximum service tariffs. The second is less important but may

influence the distribution of returns to oilseed producers and cereals producers--the differential in "shrinkage" allowed on producer deliveries into the grain handling system. Together, the regulations probably provide "umbrella" protection for grain handling firms, which reduces competition among grain handlers and, directly or indirectly, reduces incentive for improving efficiency and productivity in grain handling.

The tariffs chargeable by country elevators, inland terminals, transfer elevators, and port terminals have regulated maximums imposed by the CGC. The services covered by the regulated tariffs include elevation, cleaning, storage, weighing, etc. The charges are uniform, according to the type of service and commodity, and do not reflect differences in capacity of the service unit, time of year or location. Given the variation in size, age, density of production, turnover rates, regional dispersion, and frequency of service of rails across the west, it would be expected that costs of operation of at least the country elevators would also vary considerably. It has been suggested by several observers of the system that the rates are established at levels which protect most of the elevators and, therefore, generate substantial excess benefits for the very efficient. It has also been suggested that the tariffs protect and maintain many outdated plants which otherwise would disappear or be replaced. There is little evidence of competition on rates charged by elevators for conventional services, especially CWB grains, although rates appear to be more variable and even negotiable to a very limited extent in some special crops. Consequently, it is concluded that the maximum tariffs result in lack of competition on the regulated services and some degree of perpetuation of uneconomic facilities.[14]

A second instance in which CGC regulations may result in less competitive handling of grains is in the case of shrinkage. Shrinkage is

the term used to cover leakages or "shorts" that occur between the producer, delivery and final sale at terminal or "on vessel." It is comprised of losses within the elevator, rail car leakage, dust, wearing out of grain as it is moved, and spillage. The CGC permits a "shrinkage" deduction at the point of purchase (producer cash ticket) of 0.25 percent (by weight) on cereals and 1.0 percent (by weight) on flax and canola. Again, it appears that this deduction is generally taken by elevator companies at its regulated maximum, irrespective of the destination or nature of the final sale.[15] These numbers represent a huge annual levy against producers. These regulations have been in existence since the 1930's and despite a claimed review in the 1970's, the allowable shrinkage has remained the same. Three questions arise: (1) is a fixed shrinkage figure taken at source (a direct farmer cost for elevator losses) the most effective way to cover (probably) unavoidable losses in grain handling?, (2) is the four to one ratio between oilseeds and cereals deductions (which translates to a much larger value ratio because oilseed prices usually exceed cereals prices) an appropriate reflection of real differences in losses?, and (3) why should a producer be charged shrinkage if he is paid on unload weight at the terminal or processing plant? To the extent that elevator companies automatically have their shrinkage losses covered directly at the farmer's expense, there is little incentive to reduce them. That these losses would remain constant for a 40 year period raises an interesting question on technological development in grain handling in Canada.

Another aspect of CGC policy which has become apparent is related to cleaning tolerances required to meet export quality standards. The problem is that export trade standards require an extremely small tolerance on

foreign material. Apparently, to meet these tolerances, terminals sometimes have to double clean cargoes of grain. The double cleaning, which was required for the relatively dirty 1980 crops, slowed down terminal operations, increased costs, and reduced throughput; reduced throughput naturally tends to back up grain throughout the entire system. The CGC has frequently been requested to ease the tolerances, but the official CGC position is that foreign buyers and the CWB believe the existing grade standards and foreign material tolerance are required. Canadian grain traders disagree and cite as evidence the fact that considerable U.S. grain is exported uncleaned.[16] This is an important issue that will influence Canada's ability to be cost competitive and to move grain through limited, and increasingly limited, terminal space.

Another CGC responsibility is the licensing of new varieties. Strict and rigid criteria are imposed before varieties are licensed, and limitations are placed on the marketing of unlicensed varieties. In brief, it is argued by many knowledgeable grain industry participants, including plant breeders, that many high yielding, adequate quality strains are wasted by the application of the criteria.[17] For the domestic feed grain market, this means that barley, wheat and oat production may be held back and prices may be higher than in a situation where new varieties were subject to different acceptance criteria. For wheat, it has been estimated that visual identification requirements alone may result in a 5-8 percent production loss, and the protein requirements may result in another 15-20 percent production loss.[18] Despite growing evidence in support of these implications, the CGC and the CWB official positions are that the licensing provisions are required to maintain the Canadian position in international markets.

Government financial support. An important part of the political and regulatory framework of the Canadian grain industry is the financial support provided to grain producers by the government. Large income transfers from taxpayers to the grain farmer may overshadow the negative impact of many government regulations. In other words, government subsidies will encourage grain production and the overall positive effect of these subsidies on producers may be larger than the negative effect of most of the regulations discussed above. Dismantling some of the major regulations could, therefore, lead to a reduction in subsidies required to keep the industry profitable.

Unlike the U.S. government's involvement in the grain markets, Canadian policy does not generally involve direct income or price supports. One notable exception was the Lower Inventories for Tomorrow (LIFT) Program in 1970, whereby farmers were paid to set aside acreage. The CWB's initial payment is guaranteed by the Federal government, but it has rarely acted as a support price and when it has, the impact has likely been small.

The majority of government support in the Canadian grain industry has been in the form of transportation subsidies. The Federal government has funded part of the "Crow gap" which the railways have suffered as a result of moving grain at rates below cost.

Table 24 provides estimates of the various supports provided to Canadian wheat producers from 1970 to 1980. A discussion of the various programs and similar calculations for other grains is provided by Glenn, Carter and Tangri.[19] The largest transfers in Table 24 occur as transportation subsidies. Over the 10 year period shown, the proportional subsidy in the wheat sector, which is the total producer subsidy as a percentage of the total producer value, averaged 14.5 percent. By

Table 24

Canada - Wheat
Subsidies: 1970-1980

Crop Year	Total Producer Value (000 $)	Policy Transfers to Producers: Two Price Wheat (000 $)	ASB Payment	Feed Freight Assistance (000 $)	Export Credit (000 $)	Western Grain Stabilization (000 $)	Corn Comp. (000 $)	Temporary Wheat Reserves Act (000 $)	Transport Subsidy (000 $)	Feed Reserve Program (000 $)	Crop Insurance Fed. Cont. (000 $)	Wheat Reduction Program (Lift) (000 $)	Total Producer Subsidy (000 $)[a]	Proportional Subsidy %[b]	Subsidy Per Unit ($/tonne)[c]
1970	498,522	--	--	6,762	--	--	--	33,209	53,445	--	508	63,161	157,085	31.51	17.41
1971	756,400	--	--	5,324	2,291	--	--	25,801	88,595	--	708	--	122,719	16.22	8.52
1972	1,059,290	65,500	--	6,729	2,106	--	--	12,775	128,738	--	1,013	--	216,861	20.47	14.94
1973	2,618,630	118,179	--	5,190	5,946	--	--	--	126,264	--	8,293	--	263,872	10.08	16.33
1974	2,070,749	87,665	--	5,240	11,332	--	--	--	118,419	--	14,394	--	237,050	11.45	17.83
1975	2,341,257	65,422	--	3,456	9,667	--	--	--	157,432	1,644	21,850	--	259,471	11.08	15.19
1976	2,532,418	17,104	--	2,270	7,743	--	-1,275	--	182,292	1,160	26,353	--	235,697	9.31	9.99
1977	2,166,216	39,425	24,050	2,740	6,771	46,430	-85	--	237,728	1,403	36,084	--	393,546	18.17	20.03
1978	3,164,240	43,826	--	4,123	11,409	106,130	-74	--	211,146	954	32,219	--	409,633	12.95	19.41
1979	3,184,735	-54,600	--	4,007	16,448	--	-3,348	--	294,401	1,178	22,198	--	290,284	9.11	16.88
1980	4,039,650	-4,700	--	3,776	19,800	--	-2,976	--	323,871	--	44,372	--	384,143	9.51	20.05

[a]Total Producer Subsidy = Policy Transfers to Producers.'

[b]Proportional Subsidy = $\frac{\text{Total Producer Subsidy}}{\text{Total Producer Value}} \times 100$.

[c]Subsidy per Unit = $\frac{\text{Total Producer Subsidy}}{\text{Total Production}}$.

Source: M.E. Glenn, C.A. Carter, and O.P. Tangri. "Government Support in the Grain Sector: A Canadian - U.S. Comparison," Working paper, Department of Agricultural Economics, University of Manitoba, 1983.

comparison, the U.S. level was estimated by Glenn et al. to be 12.5 percent for the same period. The U.S. level is also much more variable from year-to-year than the Canadian level. These figures indicate that the social cost of grain production is significantly higher than the private producer's cost. If Canada is going to maintain its market share of the international grain trade to 1990, this government spending will have to remain in place.

Grains, Policy and Politics

Grains and grains policy have been instruments of national policy in Canada ever since agricultural settlement began on the Prairies in the latter half of the nineteenth century. Aggressive immigration and railway construction policies were used to promote settlement in the 1870's and 1880's. The Crow Agreement of 1897 reinforced these development objectives and ensured an expanded market for goods produced in the east. The drought and depression of the thirties were significantly identified with Prairie agriculture, and several important policy initiatives, including the establishment of the CWB in 1935, were undertaken during that period. The establishment of the CWB was intended to reduce the likelihood of recurrence of a national economic disaster in the Prairie grain economy; however, it was not until 1942 that wheat came under compulsory regulation by the CWB as it was then argued that wheat was contributing to the national interest in the war effort. The debate and policy formulation on feed grains in the 1970's (pre 1973, the Interim Policy of 1973-74, the Policy of 1974, and revisions in 1976), and again in 1981 and 1982, clearly reflected the national dimension of policy formulation for western grains. In 1980, the major component of Canada's reaction to the Russian invasion of Afghanistan was (ostensibly) embargoing grain sales to the Soviet Union. Almost one hundred years after the inception of statutory grain rates, the

nation was embroiled during 1982 and 1983 in a heated debate on if, and how, the Crow rates should be changed. When the rates were changed, a solution was sought in which not only a transportation rate issue (on western grains) was resolved, but rather one in which east and west, grain and nongrain, agricultural and major nonagricultural concerns could be served. Few sectors of the Canadian economy, irrespective of size, share this degree of national prominence, and it is doubtful that any other national economic issues (with the possible exception of railways and tariffs) have the political tenure of grains.

Within agriculture there are powerful divisive forces at work. The CWB has been viewed by eastern livestock feeders (and politicians) with considerable suspicion over the years. In exercising its legal mandate, the CWB has provided some grounds for eastern resentment. The Federal response to meeting these suspicions has come in several forms: establishing the Canadian Livestock Feed Board to exert countervailing power, providing supply assurances on feed grain, introducing the corn competitive pricing formulae, establishing open quotas on feed grains for a while, etc. Often these responses result in more regulation and more distortion of market signals, and usually increased uncertainty for grain producers. In another dimension of the grain market, western livestock producers and many western feed grain producers view the Domestic Feed Grain Policy as a major concession to eastern livestocsk producers. These views were reinforced when Quebec farm organizations and politicians entered the Crow debate to extract concessions from the Federal government after a form of western compromise had been achieved in 1982.

These differences in beliefs concerning grains policy between the east and the west in Canada, and between livestock and grain producers,

have logical economic origins and are in significant measure, natural. However, the structure of the Federal government during most of the last two decades, and the national prominence of western grains and transportation policy have sharpened the divisions. Moreover, the decade of the seventies, for a variety of reasons, has been the most active period in Canadian history for federal agricultural policy development. In several important ways the grain marketing system was opened up to economic forces (e.g., feed grain policy, the Western Grain Stabilization Program, reductions in feed freight assistance, announcing initial prices prior to seeding, purchase of rail cars, etc.). However, much of the basic regulatory structure remains, and the political sensitivity of many of the changes have resulted in offsetting influences which have reduced the potential economic benefits within the western grain industry.

Adding to the difficulty of effecting national economic change is the structure of the dominant farm organization, the Canadian Federation of Agriculture (CFA). The CFA is a collection of commodity groups, trading organizations and farm organizations operating at the provincial level, which form a national federation. The same divisions occur within CFA that were described earlier in the broader political environment. On many occasions, especially during the Feed Grain Policy debate throughout the 1970's and the Crow debate more recently, the CFA has been incapable of resolving its own internal conflicts and offering a unified policy approach. While it is not surprising that this is the case on major issues, it does produce the situation in which the policy process within agriculture may be stymied and major policy decisions are delayed or postponed entirely.

As a consequence of this institutional-political framework, the adaptability of the western Canadian grain industry to changing economic

conditions is retarded, while many nongrain issues significantly influence grains policy, and noneconomic considerations play an important role in resolving economic issues.

Summary

This chapter has provided a discussion of the institutional, political and regulatory framework within which the western Canadian grain industry operates. Major institutions and regulations were described and their economic effects on the grain markets were briefly discussed.

The major institutions covered were the Canadian Wheat Board (CWB), Canadian Grain Commission (CGC), Grain Transportation Authority (GTA), and the Winnipeg Commodity Exchange (WCE). Regulations identified were the statutory freight rates, delivery quotas, price pooling, corn competitive formulae, rail car allocations, CGC regulations, and government subsidies. The sheer number of regulations and their many redundancies make the task of isolating economic impacts very difficult; however, it seems that rationalization of the transportation system would render many of the regulations unnecessary and, therefore, contribute greatly to a more efficient path of development. More often than not, the regulations discussed above are related to the inadequacy of the grain transportation and handling system in Canada. A byproduct of the creation of an environment for a more efficient grain marketing system would be reduced demand for government financial assistance by farmers.

FOOTNOTES

[1]Canadian International Grains Institute. Grains and Oilseeds: Handling, Marketing, Processing, 3rd edition, (Winnipeg: Canadian International Grains Institute, 1982).

[2]A.F. McCalla, and A. Schmitz. "Grain Marketing Systems: The Case of the United States Versus Canada," American Journal of Agricultural Economics, Vol. 61, No. 2, May 1979.

[3]Loyns et al., op. cit., Chapters 5 and 6.

[4]Canada, Laws, Statutes, etc. Canadian Wheat Board Act: Office Consolidation, (Ottawa: Canadian Government Publishing Centre, 1978).

[5]IBI Group/Theo Joseph Inc. Improvement in Grain Car Allocation Procedures, report prepared for the Grain Transportation Authority, Winnipeg, August 1981.

[6]C. Snavely. "Costs of Transporting Grain by Rail," report prepared for Transport Canada, Washington, D.C., 1982.

[7]D.R. Harvey. Christmas Turkey or Prairie Vulture? An Economic Analysis of the Crow's Nest Pass Grain Rates, Ottawa: The Institute for Research on Public Policy, 1980.

[8]Alberta Agriculture. A Discussion Paper on Current Issues in Grain Handling and Transportation, (Edmonton: Alberta Agriculture, 1979), p. 67.

[9]Beginning with the 1982-83 crop year, producers who summerfallow less than one-third of their acreage receive bonus quota acreage, a step towards reflecting the increased productivity associated with continuous cropping.

[10]J. Groenewegen. "Feed Grain Policy Objectives in Canada." Discussion paper, Agriculture Canada, Ottawa, 1982.

[11]Protein levels in grain are influenced by variety, area, growing conditions, and certain management practices.

[12]D.F. Kraft. "An Economic Analysis of the Corn Competitive Formulae," Working paper, Department of Agricultural Economics, University of Manitoba, 1982.

[13]"Producer car" is a term used to describe the process in which individual producers order, load and ship their own rail cars, thereby passing the elevator and elevation charges. It was a right provided producers in 1909 and has been maintained since even though the volume of grain shipped that way was negligible until recently, and even now it represents a very small proportion of total shipments.

[14]Many of these points were raised and debated at the Tariff Hearings of the Canadian Grain Commission in April, 1984. One reviewer of

an earlier draft of this paper did not agree with the arguments presented.

[15]The real shrinkage on barley delivered to a country elevator and sold locally, versus barley sold uncleaned to eastern Canada, versus barley sold cleaned to export, surely would be significantly different. Similarly, flax or rapeseed exported through Vancouver would be expected to have more shrinkage than flax sold off-Board or rapeseed sold to a crusher where the produce retains ownership to the point of processing.

[16]The Canada Grains Council reached much the same conclusions in their recent report, Grain Grading for Efficiency and Profit, 1982.

[17]c.f. Walter Bushuk, Plant Science - Summation, pp. 12-13, Prairie Production Symposium, Saskatoon, October 29-31, 1980.

[18]Canada Grains Council, op. cit., pp. 138-73.

[19]M.E. Glenn, C.A. Carter, and O.P. Tangri. "Government Support in the Grain Sector: A Canadian - U.S. Comparison," Working paper, Department of Agricultural Economics, University of Manitoba, 1983.

V. A REVIEW OF THE MARKET ENVIRONMENT FOR CANADIAN GRAINS IN THE 1980'S: DOMESTIC AND INTERNATIONAL

Introduction

On average, Canada produces approximately 45 million metric tonnes (mmt) of grain and oilseeds each year. This represents an insignificant amount (less than 3 percent) of total world production; however, because of its small population, more than 50 percent of Canadian production is exported making Canada the second largest grain exporter in the world behind the United States (U.S.). These two countries, the United States and Canada, plus Australia, Argentina, South Africa, France and Thailand, provide the bulk of the world's grain exports. There are numerous countries which import grain, with Japan, the European Economic Community (EEC), Union of Soviet Socialist Republics (USSR), and China dominating this side of the market.

Almost 90 percent of Canada's grain is produced in the three Prairie provinces: Alberta, Saskatchewan and Manitoba. Domestically, this makes western Canada the net producing region and eastern Canada the net consuming region. Normally, about 50 percent of Canada's seeded acreage is planted to wheat, making it by far the most important crop in both volume and value. Usually Canada exports more than 75 percent of its wheat production. At one time Canada was the world's largest wheat exporter; however, during the 1960's and 1970's its market share fell behind that of the U.S.

Barley is Canada's second most important crop in terms of volume. In terms of world barley production, Canada ranks second behind the USSR. On average, of the 11.5 mmt produced, about 4.5 mmt are exported, making

Canada the world's largest barley exporter, with France a close second. The largest use of barley is as livestock feed. A second use of barley is for malting purposes. While malting barley commands a higher price than feed barley, it represents a relatively small portion of barley production.

Canada is the world's largest producer of rapeseed (2.5 mmt), the second largest producer of flaxseed (.6 mmt), and the major exporter of both of these oilseeds. The majority of the oats (3.5 mmt) and corn (5.2 mmt) produced in Canada are marketed domestically for feed use. The remaining crops of rye, soybeans, sunflowers, fababeans, lentils and forage seeds are produced on a smaller scale in Canada. Production and export figures for the major Canadian grains are summarized in Table 25.

The international marketplace is not only important for grain producers; it is also important for the Canadian economy as a whole. This is because the agricultural trade sector has been one of the major factors behind Canada's maintenance of a positive net merchandise trade balance in the 1970's (Table 26). Of the cumulative net trade balance of $12.2 billion for the 1971-80 period (it was negative for 1974-76), agricultural net trade contributed $10.9 billion. Grain and grain products comprised more than 70 percent of total agricultural exports.

The purpose of this chapter is to review both the domestic and international market environment for Canadian grains in the 1980's. A primary objective of the chapter will be to assess the future course of those factors which will determine the market potential for Canadian grains.

Domestic Considerations to 1990

In the past two decades, the domestic market for Canadian grain has grown much slower, but has been much more stable, than the foreign market

Table 25

Canadian Grain Production and Export Figures:
1977/78 - 1982/83 (Millions of Tonnes)

Crop Year (Aug.-July)	Wheat		Oats		Barley		Rye		Flaxseed		Rapeseed		Corn		Soybeans	
	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports
1977/78	19,862	16,041	4,303	91	11,799	3,589	406	263	653	271	1,973	1,014	4,197	525	580	64
1978/79	21,145	13,085	3,620	17	10,388	3,862	605	154	571	493	3,497	1,721	4,033	193	516	91
1979/80	17,184	15,888	2,978	103	8,460	4,147	525	397	815	449	3,411	1,743	4,983	545	671	54
1980/81	19,158	16,260	3,028	46	11,259	5,574	448	446	465	563	2,483	1,572	5,434	1,057	713	142
1981/82	24,802	18,443	3,188	50	13,724	6,012	927	547	468	443	1,857	1,359	6,743	1,133	602	83
1982/83	27,000[a]	20,000[a]	3,700[a]	80[a]	14,000[a]	5,800[a]	850[a]	200[a]	740[a]	400[a]	2,100[a]	1,200[a]	5,900[a]	800[a]	850[a]	90[a]
Average 1977-83	21,525[a]	16,619[a]	3,470[a]	64[a]	11,530[a]	4,497[a]	627[a]	334[a]	619[a]	436[a]	2,550[a]	1,401[a]	5,215[a]	642[a]	653[a]	87[a]

[a]Preliminary.

Source: Canada Grains Council, Statistical Handbook '82, Winnipeg, Manitoba.

Table 26

Canada and the World: Trade Statistics
1951-80 (Billion $ Canadian)

Year	Total Exports/Imports					Agricultural Exports/Imports				
		Exports		Imports			Exports		Imports	
	World[a]	Canada	(%)	Canada	(%)	World	Canada	(%)	Canada	(%)
1951-55 Av.	84.4	4.1	(4.9)	4.3	(5.1)	26.7	1.0	(3.7)	.5	(1.9)
1956-60 Av.	109.7	4.9	(4.5)	5.5	(5.0)	30.6	1.0	(3.3)	.7	(2.3)
1961-65 Av.	167.5	7.1	(4.2)	6.9	(4.1)	41.1	1.4	(3.4)	1.0	(2.4)
1966-70 Av.	265.6	13.1	(4.9)	12.3	(4.6)	51.0	1.5	(2.9)	1.1	(2.2)
1971-75 Av.	609.8	25.2	(4.1)	24.9	(4.1)	96.1	3.0	(3.1)	2.1	(2.2)
1976	976.8	37.7	(3.9)	37.5	(3.8)	129.7	4.0	(3.1)	3.1	(2.4)
1977	1,198.9	43.7	(3.6)	42.4	(3.5)	161.4	4.3	(2.7)	3.6	(2.2)
1978	1,484.2	52.3	(3.5)	50.1	(3.4)	194.7	4.9	(2.5)	4.0	(2.1)
1979	1,906.0	64.2	(3.4)	62.7	(3.3)	233.5	6.1	(2.6)	4.7	(2.0)
1980	2,324.0	74.2	(3.2)	69.0	(3.0)	266.2	7.8	(2.9)	5.1	(1.9)

[a]World trade is given in terms of exports only.

Source: G. Storey, C. Carter, and K. Meilke. "Canadian Agricultural Trade: Its Current and Future Performance," Agronews, November 1982.

and this trend is expected to continue for the next decade. Between 1960-61 and 1980-81, Canadian wheat exports increased by 62 percent while domestic use increased by only 27 percent. During the same period, barley exports increased by 149 percent and domestic use by 74 percent. As a percentage of production, the domestic use of barley, primarily as livestock feed, is about 60 percent while domestic wheat use is less than 30 percent.

In the domestic market environment, the evidence for the 1980's point to the following:

1. The traditional eastern consuming regions for feed grains are becoming self-sufficient (through production of corn and feed cereals) and thus west-to-east flows will probably decline significantly.
2. Livestock numbers and thus the demand for feed grain will not grow as rapidly as they have in the past.
3. Domestically oriented policy will continue to take precedence over international trade policy in grains.
4. The annual growth in the domestic use of feed grains will continue to outpace that of wheat.
5. The rationalization of the statutory freight rates on grain will significantly affect both domestic and foreign trade flows.

The growing self-sufficiency in feed grains in eastern Canada is largely attributable to increased corn production in Ontario, although Quebec production has also increased. By 1990, it is projected by Agriculture Canada that feed grains flows from western to eastern Canada could be approximately one-half of what they were in 1980.[1] If barley production is to be simply maintained at current levels in western Canada, this indicates barley exports will have to increase, unless

there was a major increase in livestock production on the Prairies. If barley production expands, however, then there will be even greater pressure on the export barley market.

The per capita consumption of meat in North America, which is significantly affected by real income, is not expected to grow as much in the 1980's as it did in the previous two decades,[2] and thus livestock numbers should grow at slower rates. However, the degree to which livestock feeding will expand is also largely a function of uncertain variables such as inflation, grain prices, the exchange rate, etc.

In the grains, poultry and livestock areas, Canada has chosen to place domestically oriented policy ahead of international trade policy. For example, the numerous supply-management marketing boards have raised domestic prices, reduced Canada's potential to export poultry products and almost guaranteed a reasonably constant level of imports. Because the production of poultry is held back by regulation, the domestic demand for feed grains is also limited. In addition, government policy relating to feed grains insulates Canada from world feed grain prices at times with consequent misallocation of resources. Provincial and federal policies have not only inhibited world agricultural trade but also interprovincial trade, and this trend towards balkanization seems to be continuing. Consequently, there are several forces operating to reduce the rate of growth of domestic feed grain demand.

The realignment of freight rates from statutory towards compensatory levels will undoubtedly affect grain trade flows in Canada and also the value-added component of grain exports; however, both the nature and extent of these changes is uncertain. Despite the uncertainty about Crow Rate changes and some of their impacts, there is reasonable assurance that the

problems associated with physically moving Canada's grain crop are, for the foreseeable future, behind us. The additional rolling stock provided by the Alberta and Saskatchewan governments, the Federal government and the CWB, as well as expenditures by the Federal government and railways on infrastructure should provide adequate capacity for the remainder of the decade.

On balance, the domestic market for Canadian grains will not be able to absorb production increases beyond about 1.0-2.0 percent per annum. The United Nations Food and Agriculture Organization (FAO)[3] projections for growth rates in Canadian domestic use are approximately 2.0 percent; those of the Canada Grains Council (CGC)[4] are about 1.0 percent. If grain production in Canada continues to increase during the 1980's at a rate similar to that experienced in the past two decades (close to 4 percent per annum), then additional export channels will have to be found. The export, rather than the domestic, market environment will thus largely determine the opportunity for Canadian producers to increase sales.

The CGC study examined the feasibility and impacts of expanding Prairie grain production to 50 mmt by 1990, which is the target set by the Canadian Wheat Board. The study concluded that the production target would be met by bringing 1.2 m hectares of new land (mostly Class 3) into production, reducing the amount of land in summerfallow on the Prairies from 9.3 m hectares in 1981 to 7.1 m hectares (2.2 m hectares decrease), and by increasing yields through improved management practices to make use of the best technology and plant varieties currently available. Although production levels may be jeopardized by soil degradation, it was felt that the problem could be easily overcome with currently available technology and management practices. The CGC study projected a decrease in feed grain use on the Prairies of 21 percent by 1990 due to increased feeding

efficiency. Processing grain use (primarily malting barley and rapeseed) is anticipated to triple from 1.17 m tonnes per annum (1976-77 to 1980-81) to 3.54 m tonnes by 1990.

On the domestic supply side, the CGC study is thus very optimistic that grain[5] production will increase from an average base (1976-81) level of 35.6 mmt to a projected 1990 level of 48.8 mmt. This represents approximately a 37.1 percent increase over the 10 year period. However, on the domestic demand side, the study portrays a much different scenario and is quite pessimistic. Total domestic use of these grains is projected to increase by only 11 percent over this same period. The CGC is, therefore, implicitly assuming that the international grain market will absorb much of Canada's projected production increase in the 1980's.

Of some additional concern in considering Canada's ability to increase exports, assuming transportation will not be a constraint, is terminal capacity. Geography has blessed the Canadian grain industry with large quantities of good land, but it also requires that the grain be transported long distances to ports for export. In addition, our geography has provided a very limited number of ports and they are now becoming the limiting factor in grain handling and movement. The increases in trade have been, and likely will continue to be, through the Pacific ports--Vancouver and Prince Rupert. Vancouver is already congested with grain and other trade and offers little opportunity for expansion. Prince Rupert is being expanded and is projected to provide sufficient capacity for the 1980's. The Port of Churchill does not appear to offer much, if any, opportunity for economic expansion of terminal capacity. The Lakehead and St. Lawrence terminals could be expanded, but they have the disadvantage of distance from source, distance from market, and the expense and constraints

imposed by the St. Lawrence Seaway. In order to reduce the likelihood of the terminals becoming a bottleneck to increased exports, the existing (and projected) capacity has to be very efficiently used, and new options considered.

Several steps have been taken to improve port capacity including expansion of the Prince Rupert facility. There are ways to ensure efficient use of existing capacity, such as the use of unit trains, reduced terminal handling and cleaning, inland cleaning, and reduced numbers of grain grades. Probably more important than any of these is the requirement to keep the terminals and associated services operating by avoiding work-stoppages, lock-outs and the other management-labour disruptions that have reduced terminal throughput in recent years. As a result of the limited number of ports and the concentrated activity at these ports, there are many sources (Harbours Board, tug boat, inspectors, grain handlers, stevedore, etc.) of disputes, most involving a relatively small number of employees and employers. Since there are no alternatives to moving export grain through the ports, if the terminals and ports were to become more constraining to the systesm, lost time would mean lost sales volume and back-ups throughout the entire western grain industry. This problem is part of Canada's overall declining performance due to labour-management disputes, but it is somewhat more acute in this case than in many because of the bottleneck effect of the ports and terminals on export trade.

Alternatives to the existing transportation and terminal system are not readily available. As transportation rates rise, the economic feasibility of grain shipments south out of the Prairies might improve. The logistical and political considerations of this option are, however, undefined. Two additional options that have been subject to some study, but are of the futuristic variety at this stage, include pipelining grain

directly to vessels, and dirigible trains. Consequently, an important domestic issue essential to grain exports is to ensure that port and terminal capacity is used as efficiently as possible.

International Considerations to 1990

World agricultural trade in grains and oilseeds grew tremendously, both in terms of volume and value, during the 1960's and 1970's, but the largest gains were made in the 1970's. Trade in wheat increased from 49.0 mmt in 1960-61 to 97.3 mmt in 1980-81, an increase of close to 100 percent. During the same period, the coarse grain trade increased from 25.8 mmt to 117.0 mmt, or by 353 percent, and trade in oilseeds more than doubled. The growth of trade in grains and oilseeds in the 1980's is not expected to match that of the 1970's.

The 1970's witnessed U.S. grain exports growing at an average of 12 percent per year, while grain production rose only by an average of 4 percent per year. Over the same period, Canada's exports grew at about 5 percent per annum, with production increasing at approximately 2 percent.[6] Given that Canada and the U.S. account for 70 percent of the world grain trade, and that by the early 1980's they were unable to keep pace with growing world demand, food security became a major issue. The shortage during this period is verified by Table 27 where world grain stocks-to-use ratios are displayed. The concern was that North America was no longer able to feed the world. A similar concern had also been raised in the mid 1960's and the early 1970's. However, as before, the 1980 concern over low grain stocks and high prices quickly subsided with record "back-to-back" crops in 1981 and 1982. Coupled with the abundant grain harvests was a

Table 27

Ratios of World Wheat and Coarse Grains
Stocks to Utilization
1971-82

	Total Utilization (million tonnes)	Stocks (million tonnes)	Stocks/Use (%)
1971	933.6	146.8	15.7
1972	956.0	167.2	17.5
1973	988.1	131.4	13.3
1974	1,037.0	134.2	12.9
1975	995.0	119.5	12.0
1976	995.8	119.9	12.0
1977	1,061.4	177.1	16.7
1978	1,094.7	169.1	15.4
1979	1,178.8	192.8	16.4
1980	1,184.4	173.6	14.7
1981	1,185.8	160.7	13.6
1982	1,174.1	200.6	17.1
1983[a]	1,215.4	244.3	20.1
1984[b]	1,234.2	175.5	14.2

[a]Preliminary estimate.

[b]Projected.

Source: U.S.D.A., F.A.S., Foreign Agricultural Circular, (various issues).

dramatic fall in grain export demand. Corn exports fell in 1982 by roughly 20 percent and wheat by 10 percent as a result of the world recession, high interest rates and a strong U.S. dollar.

These statistics are troubling to economic forecasters. Twice in the last decade and once in the previous decade, the threat of grain shortages has loomed, but these threats have disappeared as quickly as they appeared with swings in weather and general economic patterns. However, there is some evidence that in the last two decades the world has become more vulnerable to crop failures. For example, the 1983 drought in the U.S. resulted in a rapid and sustained rise in grain prices, but throughout these years real grain prices have fallen. Even with the 1983 jump in prices, real prices are only close to those of 1978-79.

Several long-term forecasts of global grain production, use and trade have been completed recently by major organizations: Australian Department of Trade and Resources (ADTR), International Wheat Council (IWC), International Food Policy Research Institute (IFPRI), FAO, Leontief et al., World Bank, O.E.C.D., Global 2000, and Michigan State University (MSU). These studies have adopted various methodologies, ranging from simple linear projections of past trends (ADTR, IWC) to the use of simultaneous equation econometric models (MSU, Global 2000). Not only do their methodologies differ, but each study makes explicit assumptions regarding exogenous variables, such as income growth, population growth, input costs, etc.

A subset of the results from three of the more recent projection studies are reported in Table 28 for purposes of comparison. Both the ADTR and the MSU study provide global projections to 1990, while the IWC study projects to the year 2000.

Table 28

Comparison of Grain Production, Consumption and Trade Projections

Item	IWC 1980 Base	IWC 2000 Projection	ADTR 1980 Base	ADTR 1990 Projection	MSU 1980 Base	MSU 1990 Projection
	million tonnes					
World - Total Grains						
Production (growth rate)	1,577[a] (2.8)[b]	2,384 (2.1)	1,610 (2.8)[c]	2,071 (2.5)	-	-
Use (growth rate)	1,451 (2.7)	2,177 (2.0)	1,610 (2.8)	2,071 (2.5)	-	-
Total Trade (growth rate)	209 (5.4)	265 (1.2)	209 (5.4)	345 (5.1)	-	-
World - Wheat						
Production (growth rate)	442 (3.2)	682 (2.2)	-	-	441[d] (n/a)	549.1 (2.2)
Use (growth rate)	449 (3.1)	682 (2.1)	-	-	449 (n/a)	550 (2.0)
Total Trade (growth rate)	94 (4.1)	114 (1.0)	-	-	71[e] (n/a)	100 (3.5)
World - Coarse Grains						
Production (growth rate)	746 (2.4)	1,068 (1.8)	-	-	730 (n/a)	930 (2.4)
Use (growth rate)	739 (2.4)	1,068 (1.9)	-	-	742 (n/a)	935 (2.3)
Total Trade (growth rate)	103 (7.4)	137 (1.5)	-	-	89[e] (n/a)	135 (4.2)

[a]Average of 1979-81, centered on 1980.

[b]Growth rates are annual percentage changes 1969-80.

[c]Base growth rates are annual percentage changes 1972-80. Base production is 1980.

[d]Base production is 1980.

[e]U.S., Canada, Australia and Argentina exports only.

Source: International Wheat Council, "Long Term Grain Outlook," Secretariat Paper No. 14, London, August 1983.

Australian Department of Trade and Resources, "The World Food Economy in the 1980's," December 1982.

Michigan State University, "Long Term Forecast," Department of Agricultural Economics, Michigan, Fall 1982.

It is striking to note from Table 28 that each study projects a downturn in the rate of growth of global grain production, consumption and trade. The studies differ only on the estimated magnitude of the downturn. The IWC is the most pessimistic of the studies shown in Table 28. From an average annual 1960-80 growth rate of 5.4 percent, the IWC projects the annual growth in total grains traded to fall to 1.2 percent between 1980-2000. A more optimistic figure is given by the ADTR study, which predicts the annual growth in trade to be 5.1 percent between 1980-90.

The IWC forecasts trade in wheat to grow at only 1.0 percent per year and trade in coarse grains to grow at 1.5 percent per year. The MSU model predicts much higher trade growth rates for both wheat and coarse grain, 3.5 percent and 4.2 percent per year, respectively.

Due to Canada's heavy dependence on trade, the implications of these projections are important. It appears that the opportunity to expand grain exports will not be as great in the 1980's as it was in the 1960<s and 1970's. By 1990-91, the MSU model projects annual Canadian wheat and coarse grain production to be 29.0 mmt and 28.0 mmt, respectively. The MSU model estimates exports of Canadian wheat and coarse grains will average 22.9 mmt and 9.1 mmt, respectively, in 10 years time. By contrast, the CGC projects lower production levels than the MSU model, but higher export levels. The CGC estimates total grain exports will increase by 3.8 percent per annum, wheat exports by 3.5 percent, and barley exports by 4.4 percent to 1990. These export projections are very reasonable compared with the alternative forecasts summarized in Table 28. In contrast, projections of annual export growth by the CWB (see Jarvis) and Agriculture Canada (see Borland and Robertson) are much more optimistic. The CWB projects Canadian

wheat exports to grow at an annual rate of 4.5 percent while Agriculture Canada's estimate is 4.1 percent.

The MSU projections are based on rising (8 percent per annum) nominal grain prices, but constant real grain prices between 1980 and 1990. Prices are, of cource, critical determinants of production, use and trade and, as Table 29 shows, there is little consensus on trends in grain prices between 1980 and 1990. The MSU assumptions are neither high nor low when compared with other studies. One might, however, question the assumption of constant real grain prices over the next decade when the trend for at least two decades has been downward. This is supported by Borland and Robertson, who project real food prices will fall by 1 percent per year to the year 2000.

For a variety of reasons, the developing countries have become the major importers of wheat, while the middle income and centrally planned economies have come to dominate imports of coarse grains. Given projections of per capita caloric intake, balance of payments considerations, population and income growth, it is expected that coarse grain import demand will grow more rapidly than wheat import demand. There is, of course, more uncertainty attached to coarse grain import figures compared with those for wheat, because coarse grain demand has both a higher price and higher income elasticity.

According to the above mentioned studies, the grain exporting nations need only to increase production by between 1.5-2.5 percent annually to 1990 in order to meet world import requirements. This certainly seems feasible because, on the basis of trends alone, the annual growth rate is projected to be between 1.9-2.5 percent. Thus, ceteris paribus, world supply should have little trouble meeting world demand in the absence of widespread or global catastrophe.

Table 29

Comparison of Long Term Nominal Price Forecasts
(U.S. $/tonne)

Commodity	1981	1990
Wheat		
World Bank[a]	190	422
University of Missouri[b]	140	190
Chase[c]	160	275
Michigan State University[d]	169	318
Corn		
World Bank[e]	130	350
University of Missouri[f]	97	152
Chase[g]	107	238
Michigan State University[h]	122	246
Soybeans		
World Bank[i]	290	751
University of Missouri[j]	224	338
Chase[k]	240	489
Michigan State University[l]	271	483

[a]U.S. $/tonne, No. 1 CWRS, Thunder Bay.

[b]Average farm price, crop years (1990 refers to 1988-89).

[c]No. 1 HRW Kansas City, crop years.

[d]U.S. export price, crop years.

[e]U.S. $/tonne, #2 yellow FOB Gulf ports.

[f]Average farm price, crop years (1990 refers to 1988-89).

[g]#2 yellow, crop years.

[h]U.S. export price, crop years.

[i]U.S. (JF) Rotterdam.

[j]Average farm price, crop years (1990 refers to 1988-89).

[k]#1 yellow Chicago, crop years.

[l]U.S. export price, crop years.

Source: World Bank, "Market Prospects for Primary Commodities During the Period to 1990," Washington, January 1980.

University of Missouri, Agricultural Trade Model.

Chase Econometrics.

Michigan State University, "Long Term Forecast," Department of Agricultural Economics, Michigan, Fall 1982.

The low income developing countries did not contribute as much to the growth of imports of coarse grains in the 1960's and 1970's as did the centrally planned and developed economies. In the growth of the wheat export market, the developing countries played a larger role than the developed countries, but they in turn were dominated by the centrally planned countries. These trends will most likely continue in the 1980's.

The centrally planned economies' grain imports increased from less than 5.0 mmt in the early 1960's to more than 50 mmt in the late 1970's, with most of this increase coming about in the 1970's. These countries accounted for approximately 34 percent of all wheat imports and 23 percent of the corn imports in the 1980-81 crop year. The Canadian Wheat Board (CWB) exported 50 percent of its wheat and 48 percent of its barley to Communist Bloc countries in 1980-81. This growing independence on grain exports to centrally planned economies has economic costs associated with it as their demand has traditionally been very unstable. The IWC projects the average annual imports of grain into the USSR and eastern Europe to decline by 3.5 percent between 1980 and 2000. Imports into the Asian centrally planned economies are estimated to increase by 3 percent per annum until 2000.

In the same vein, the OECD7 projects that annual Soviet grain imports could fall below 10 mmt by 1990. The report also suggests their purchases will be much more irregular than they have been in the recent past. The Soviets are thought by the OECD to have the resources, technology and ability to improve agricultural output.

These recent studies prepared by the IWC and the OECD have very serious implications for the ability of Canada to increase grain exports in the 1980's. Many of the traditional markets for Canadian grains have been

replaced by exports to the centrally planned economies. In many cases this means Canada has replaced a relatively stable market demand with an unstable demand.

Part of the reason that the major exporters have become dependent on the centrally planned economies for grain sales is due to the restrictive trade barriers that have been erected by the developed countries, such as the members of the EEC. Their import tariffs and high support prices on grain have resulted in increased production, decreased imports, depressed grain prices outside the Community, and increased exports from the Community. A movement towards freer trade in the world grain market would undoubtedly see an expansion in trade volume and value.

The grain exporting nations may be able to remove many of these problems by moving towards some form of exporter cooperation. This would certainly not have to be as extreme as a cartel solution in order to have tremendous economic benefits within the exporting nations. As Schmitz et al.[8] have proposed, some nominal form of cooperation might be sufficient to offset the import trade barriers in the international grain market and move it closer to a free trade situation.

A final aspect of the international side of the Prairie grain industry relates to foreign exchange and currency values. Grain exports from the Prairies provide a very important source of foreign exchange for Canada. Without as large volume of grain exports, the Canadian dollar would certainly have been weaker than it was in the 1970's, and the cost of imported nonagricultural goods would have been higher.

The Canadian dollar has fallen dramatically relative to the U.S. dollar since the latter part of the 1970's Most other major currencies have fallen in terms of the U.S. Canadian dollars since 1980 and at present the U.S. dollar is likely over valued. Strengthening of foreign

currencies, relative to the U.S. and Canadian dollar, can be expected by 1990 and this prospect should favor the exportation of grain and grain products from North America. Significant improvement in the value of the Canadian dollar relative to the U.S. dollar is considered unlikely. As a consequence, prospects for improved trade conditions for Canadian grains will depend primarily on some decline in the U.S. dollar relative to other currencies. However, any significant strengthening of the Canadian dollar would depress Canadian prices and reduce export prospects.

The consensus, therefore, seems to point to the following parameters shaping the world grain environment to 1990. First, since global coarse grain demand is largely a function of income growth, this demand is projected to grow faster than global wheat demand, which is largely a function of population growth. Second, production increases are likely to be at a slower rate than have been experienced, but the world has the physical capacity to produce enough food to meet substantial increases in commercial demand. Third, the low income countries, facing exchange constraints, will not contribute significantly to a surge in grain import demand. Fourth, the centrally planned economies have become and will continue to be large factors in the world grain trade, but their requirements will continue to be uncertain from year to year. Government policies will continue to heavily influence grain prices and trade flows. Finally, North American grain exports should be assisted by some strengthening of other currencies in relation to the U.S. dollar.

Summary

This chapter has attempted to identify major characteristics of both the domestic and international market for grain which will influence the

environment for Canadian grains in the 1980's. Some of the major implications are:

1. The international grain market will provide more opportunity than the domestic market in the next decade, but overall the opportunities for expanding markets may not be as favorable as they have been in the past. Canada has not retained its share of international trade, and in a market where the growth rate is declining, sales policy will have to be aggressive to increase share.
2. The growth in demand will be greater for feed grains than food grains.
3. Canada has become very dependent on the centrally planned markets which has resulted in more uncertainty in export volumes.
4. Due to weather patterns, there will be temporary shortages of grain but, on average, production should adequately meet world demand throughout the 1980's.
5. Government policy (through production subsidies, price supports, tariffs and quotas) will largely determine trade patterns and influence price levels in the 1980's.
6. Despite food and feed shortages at times, and in some areas continuously, the incentive for increased production in Canada and the major exporting countries is retarded by price pressures and uncertainty regarding future prospects. Real prices are not expected to improve, on average, in the 1980's and they are more likely to continue their historic slide

downward. Canadian grain producers will therefore have to continue increasing their productivity and economic efficiency in order to maintain or increase returns per acre.

FOOTNOTES

[1]Agriculture Canada. "Canadian Feed Grain Policy Background Information and a Discussion of Some of the Current Issues," Ottawa, June 1982.

[2]Beef and dairy product consumption (per capita) has declined in Canada, and although pork and poultry meat consumption has increased, the net change in terms of feed grains from these trends is reduced feed grain utilization on a per capita basis. As a result, population increase becomes a more important determinant of domestic feed grain utilization than it has been in the past.

[3]Food and Agriculture Organization. "Agricultural Commodity Projections to 1985," Rome, 1978.

[4]Canada Grains Council. "Prospects for the Prairie Grain Industry: 1990," Winnipeg, 1982.

[5]The CGC projections include the five major grains only.

[6]A major contributor to the higher rate of growth in production in the U.S. was the ability to draw acreage from land banks. During the 1960's, U.S. producers were encouraged to withdraw land from production. When the boom in grain prices arrived, the Land Bank was drawn down.

[7]OECD. "Prospects for Soviet Agricultural Production and Trade," Paris, September 1983.

[8]A. Schmitz, A. McCalla, D. Mitchell, and C.A. Carter. Grain Export Cartels, (Cambridge, Massachusetts: Ballinger Press, 1981).

CONCLUSIONS AND IMPLICATIONS

Summary

The overriding conclusion from this study is that there are unlikely to be any fundamental changes, domestically or internationally, which will materially alter the existing course of development of the Western grains industry into the 1990's. In effect, our conclusion is that the most probable indicator of the next decade in Western grains is the recent past, subject only to slower or lower rates of change. The major proviso to this conclusion rests with uncertainty in the political arena since grain markets worldwide are heavily influenced by political factors and political forces. Political elements influence production levels, usage, prices and trade flows. Political uncertainty is so deeply seated in grain markets that major and fundamental change would be required to alter our conclusion--something of the order of the establishment of an effective exporter agreement, the dismantling of the EEC's Common Agricultural Policy, a reversal of Japanese trade policy, a break-down in trading relations with the Soviet Union, or a genuine global effort to feed the growing number in the world who are undernourished.

World grain reserves (relative to population or consumption) declined in the 1970's and remain low today by traditional standards. As a consequence, the balance between adequacy and shortage in food and feed supplies has become more delicate. In addition, the balance of grain trade has increasingly come to hinge on crop size and policy decisions in Communist Bloc countries, and in a relative sense, Canada has become even more heavily dependent on sales to these countries. These conditions have

led to increased variability in grain markets, and greater uncertainty for domestic producers. Despite all of these negative contributions to food stability and security, willingness on the part of exporters and importers to stabilize food supplies and markets through international co-operation has declined. Falling real grain prices combined with problems of energy, inflation and political upheavals have resulted in food concerns being assigned a lower priority.

The pressure of the world population on food resources is supposed to create opportunity for agricultural resource rich countries like Canada. There is little doubt that the volume of sales can and will increase over the next decade; the probable constraints to increased volume in international grain trade will be partly off-shore determined, but also importantly domestically sourced--ability and flexibility to produce grain, port or terminal capacity, and at the limit, perhaps handling and transportation capacity. However, the reality of world grain trade has been that prices tend to be (long-run) supply driven, and we anticipate that this will remain the case to 1990. As a result, the trend will be towards maintaining cost pressures on Prairie farmers, and a lack of incentives to radically change the structure, significance, or management practises of Prairie farms; Western Canadian farmers will continue to make decisions, and allocate resources under the perceived pressure of the "cost-price squeeze". Real grain prices have trended downward for at least the past three decades; they are likely to continue to do so for the remainder of the 1980's. It is highly unlikely that this trend will reverse so that Prairie grain farmers would experience increasing real grain prices.

These observations certainly should not be taken to imply that the world and Prairie grain farmers will not experience some sharp increases in

prices sometime before 1990. In fact, this price increase occurred in the summer and autumn of 1983 for feed grains and oilseeds in response to reduced acreage and drought conditions in the U.S. A repeat of the 1983 weather conditions in the U.S. in 1984 would almost certainly cause major increases in all grain prices and set off a round of food price and agricultural resource adjustments in the same manner that world grain and food markets reacted to Russian crop failures in the early 1970's. But an occurrence of this nature in 1984, in 1987, or in 1990 in response to a major crop failure or political upheaval somewhere in the world is precisely how grain markets have behaved in the past, and how they are expected to continue to behave for the rest of this decade.

Perhaps most importantly, all of this seems to imply how well the Western grain industry fares in this decade relative to past performance may largely be a matter which Canadians themselves can determine. That is a very different implication from the view that world food shortages will create a bonanza for grain producers, or that reduced farm prices and rising farm costs will contribute to further reductions in Canada's share of the world grain trade.

The decade of the 1970's produced some important changes in the grain industry in western Canada. This study has shown how the farm unit and its management evolved very quickly as new technology was acquired. The domestic feed grain market expanded significantly. The constraints on grain transportation have been significantly reduced, and port capacity has been increased. But much more remains to be done. At the farm level, some farming practices (especially summerfallowing) are in need of change. And despite the important changes made in the 1970's, the Canadian grain industry remains subject to a very high degree of regulation. Some of the characteristics of the industry are those which are associated with long

term, significant regulation--centralized decision making, inflexibility in the face of change, separation of power to make important decisions and the financial responsibility of the decisions, and internalization of important information.

The quick answer to altering this situation is simply to deregulate the industry. That is not, however, the solution or the perception of the solution which we have attempted to establish within this study. It is not our recommendation because it would be contrary to too many traditions in the Western grains industry, and because the regulatory system has essential and positive attributes. The issue then is to attempt to identify and modify those regulations which are unnecessarily restrictive and contrary to other public goals. One function of this study in this context, was to place before Canadians some of the major issues in development of the grains industry to 1990, add something to the information base, and seek solution by discussion. With this purpose in mind, the following section indicates major areas where policy initiatives and elements of change might be introduced to improve performance in the Canadian grain industry.

Implications

Throughout this study we have referred to structural characteristics of the grain industry that tend to reduce flexibility, retard productivity advance, and reduce performance in different ways. In broad terms these structural characteristics can be identified under headings of the competitiveness (or lack of it) of most aspects of grain marketing and the regulatory framework. There are, however, important linkages between the competitive characteristics of the industry and regulations. On the one hand, much of the early regulation in grain handling and transportation

arose because of limited market opportunities for producers and because of business practises by grain handlers, dealers, and railways which were considered to be objectionable. Today the situation is considerably different: as a result of improved communication and information systems, there is the opportunity for greater competition than actually exists even though the conventional handling and transportation systems are highly concentrated. But some regulation tends to restrict the opportunity to exercise the options which would improve competition, and to reinforce the use of the traditional system; in many important respects the objectives of the regulated and the regulators are compatible in perpetuating the existing structure. As a consequence, we view several elements of the structural framework as candidates for change.

Competition. The first of the elements of the structural framework discussed here relates to the lack of competition in grain handling. Market concentration is a problem in many Canadian industries. In this respect, grain handling and the problems of competition are similar to other Canadian industries. The approach to this problem, therefore, has to be part of a wider Canadian effort to improve competitiveness in industry in order to capture the social benefits that flow from more effective competition. This may require increased regulation, but regulation of a particular type--competition policy or, more correctly, effective competition policy. But there is also a component of the lack of competition which is grain industry specific and which can be captured by reducing structural rigidities. The most important of these is to facilitate direct producer involvement in marketing of grain--marketing his own grain, thus by-passing part of the existing system. Changes in some regulations would be required to accomplish this, as well as provision of some

facilitative functions for marketing by government. Also required would be improved information flow within the industry so that a producer could with little difficulty learn his options, and know the market opportunities which were before him. These conditions do not exist today, and the system tends to internalize information to existing participants. A second option for improving competitiveness is to encourage entry, probably by small specialized grain dealers, with access to marketing opportunities on an equivalent basis with established firms. This may imply that some foreign dealers should be encouraged to participate in western grain handling. The experiences with small grain dealers in western Canada have not all been favorable, and there may be objections to de-Canadianizing something that is almost entirely Canadian. However, the banking system was opened up slightly to competition in the last revision of the Bank Act, and it allowed some foreign banks entry. A similar approach is considered to be warranted in grain handling.

Crow related changes. The second area where structural changes have been indicated throughout this study is the regulatory framework. One of the overriding structural rigidities in the Western grains industry has been the Crow rate--it has generated serious direct constraints on Canada's ability to move grain for over a decade. More importantly, a massive regulatory framework has evolved to accommodate the problems associated with rail rates which were too low in economic terms. The indirect impacts have been signficant--a complex quota system, rail car allocation policy, modified cropping patterns including excessive summerfallow, grain backed-up on farms with a resulting incentive to produce more livestock, a struggling western oilseed crushing industry, an expensive federal subsidy program for railways and, recently, governments in the rolling stock

business. Some of these events may have occurred in the absence of the Crow rate, but there can be little doubt that they were aggravated by the structure of grain transportation rates over the 1950 to 1983 period.

Abandoning the Crow rate structure provides the opportunity, over time, to reduce or eliminate a number of these problems, and achieve considerably improved performance in grain handling and transportation. Moreover, as a consequence of the important effects that handling and transportation have on production, there is an opportunity for efficiency of grains production and productivity to improve, and for total output to increase as a result. This, therefore, provides the opportunity for western Canadians to benefit in the long run from higher transportation charges on grain.

However, to capture the opportunities that will be available requires meeting a number of conditions. First, the changes have to reflect primarily (preferably solely) the uneconomic situation in moving Western grain; administration of the changes over time should be primarily (preferably solely) consistent with correcting this uneconomic situation. If other national or regional objectives become intertwined with administration and financing subsequent programs, valuable time will be lost in effecting change, and further resource distortion will likely occur. Second, capturing the opportunities also requires that the railways are able to, and do, perform in the post-Crow environment. This is a question of rail infrastructure, transportation regulation, labour-management relations, and railway motivation. But it is also partly a question of grain industry regulation. Consequently, the third requirement of capturing the post-Crow opportunities is for Crow-built regulation to be modified or dismantled as the grain industry moves away from the Crow

environment. The major requirements to meet this condition are covered in the following discussion. Since the Canadian Wheat Board and the Canadian Grain Commission are the two major regulators in the Canadian grain industry, the remainder of the indications for structural change relate to those institutions.

The Canadian Wheat Board. In our discussion of the grain industry and its future development, a number of significant issues related to the CWB have been indicated. They relate to price signals to farmers, market distortions, and production inefficiencies. These are not, however, to be taken as blanket condemnations of the role and operation of the CWB in the Prairie grain market. The basic role of the Canadian Wheat Board as a marketing and sales arm of Prairie producers, domestically and internationally, is not challenged. In the present structure and organization of the international grain markets, there are distinct advantages to a state-owned marketing organization with greater authority than conventional private companies, irrespective of their size. This is not to say, however, that the CWB need be the sole marketing agency. This has been recognized in domestic feed grain policy where the CWB competes with private companies (and individual producers acting on their own behalf). This may also be an appropriate model for feed grain exports and has been proposed by at least one farmers' co-operative elevator company.

It must be recalled that the CWB was conceived and mandated in an era when wheat was king--on the Prairies, in the House of Commons, and in Canada's trade accounts. This dominant role of wheat was reflected in the legislation and operation of the CWB. Many of these concepts have carried over into an era when circumstances, the importance of wheat (indeed, the importance of grains in agriculture), and most importantly, producers and

their aspirations, have changed.[1] Consequently, our conclusion is that the scope of authority possessed by the CWB ought to be examined. In addition, those aspects of CWB operations that reflect the Federal government's efforts to use the CWB as an instrument of national policy ought to be reviewed, especially when they impinge on the ability of the CWB to carry out its mandate as an effective marketing agency. The Crow changes will, as indicated, provide opportunities for reducing the amount of regulation. In any event, the changed transportation rate structure may require amendments to the Canadian Wheat Board Act; this would be an opportune time to make some minor, but fundamental, changes to this important component of Western grain marketing. On the operational side of the CWB, several major changes have been discussed in this study. These are now summarized.

The quota system operated by the CWB has a major impact on resource allocation by producers. Quotas are used to ration scarce handling and transportation capacity, and to more efficiently assemble grains for export. Quotas are supposed to be "equitable" (defined in terms of access by cropped acreage), but they are not necessarily equitable (the block shipping alters the timing of shipping as it should to achieve marketing efficiency), and they have tended to penalize specialization, continuous cropping, and highly productive land, i.e., productivity. In addition, there are overlapping responsiblities between the CWB and the GTA, and the case for quotas on domestic feed grains and open-market grains is not clear from an economic or logistics standpoint. An increase in rail rates should reduce the need for restrictive quotas and much of the administrative activity which has grown up around them.

As a consequence, it is our conclusion that the GTA should acquire complete control of car allocation. As a relatively new and disinterested

third party in rail capacity distribution, it has, and is seen to have, a favorable record of improving transportation. It also has the confidence of a large component of the industry and appears to be able to deliver what is required to co-ordinate grain transportation. It is also our view that since the GTA is allocating cars, domestic feed grains and oilseeds should not require quotas. It does require, however, that GTA retain its third party position and be provided authority and staff to conduct this important work.

On quotas which remain after these changes, greater emphasis must be placed on removing disincentives to productivity if the Prairies are to achieve their production potential. The bonus acreage system introduced for the 1982-83 crop year was a significant step towards reflecting productivity differences in land. It remains, however, a system based upon market access determined primarily by number of acres cropped; productivity differences are indirectly reflected and then only partly. Again, to maximize production potential, further change is indicated.

The other major area of CWB operations which has been discussed is the dual responsibility in revenue pooling and pricing. There are two general problems in this area--information flows, and distortions in market signals which produce distortions in resource allocation. Returns pooling implies some form of delayed payment scheme, and averaging; the longer the pooling period and larger the area over which it applies, the greater is the averaging process and delays. That is not to say, however, that the pooling process cannot be made to reflect important economic differences or variables if the objective leans more to productivity than to equality of payment. Market signals can be reflected in a pooling system, or parallel

to it, especially in the CWB context where sales and individual producer accounts are fully computerized.

An important first step in resolving part of the pooling problem is in improving the timeliness of setting and changing CWB initial prices, and in providing indications of what final payments (and therefore, final prices) will be. The present CWB system generates final prices between six and eighteen months after grain delivery meaning that the final price on one crop is not known until after the subsequent crop is planted. The CWB and Federal government have been unwilling to either speed up the process of information flow on final payments or, alternatively, to provide hard updates on market information which might be used to estimate final payments. Private efforts to estimate CWB final payments have, on occasion, been met with some skepticism and suspicion by the Board. Only the initial payments have been used to improve market signals but even there, the efforts could be strengthened. For example, in 1981, the initial prices were not announced until well after planting, because conditions were "too uncertain".

In the summer of 1983, after a significant drop in the initial prices for barley when they were announced in April, and despite strong feed grain markets for four months of the new crop year, Cabinet did not approve increases in feed barley and oats initial payments until October. During the August to October period, the entire barley market in Canada was responding to Board prices that were too low, as well as the uncertainty of if, when and by how much the initials would increase. When they were raised, only feed oats and feed barley were changed; initial prices for designated oats and designated barley were not changed. In announcing the barley and oats initial price increases in October, the Minister in Charge of the Canadian Wheat Board praised the prompt action of the Federal

government in responding with dispatch to the changed conditions of the feed market. Several weeks or months delay in adjusting an important regulated price like the CWB initial price on barley may be prompt action by some standards, but it is sufficient time to produce serious distortions in the Canadian grain market.

A further modification to the pool structure which could improve pricing efficiency relates to a time-scaled payment scheme for producers. At present, a single initial and final payment scheme for each pool is employed irrespective of delivery date. Deferred sales are allowed (storage tickets) and expiring quotas are often employed to attract deliveries. In effect, the quota system encourages delivery of grain whenever quotas are opened, irrespective of individual management practises or the overall inventory situation. A time-based payment schedule, which is allowed by the Canadian Wheat Board Act, which would cover at the minimum on-farm storage costs might improve on the present situation. It has economic appeal because it should improve the economic rationale of producer deliveries. It may also have important practical benefits if it would provide payment for storage for those (higher productivity) farmers who now must delay deliveries because quotas based on acreage are constraining. Such a payment schedule may reduce the pressure on the system at any one time and thereby reduce the need for quotas, and finally, it may encourage some short-term increase in the cheapest form of storage, on-farm storage.

Similarly, there would be an improvement in pricing efficiency if regional pools based upon terminal sales outlets were established. The f.o.b. for most grains is highest at the West Coast, therefore, producers closest to these ports in an unregulated framework would receive higher net

prices. Under pooling as it is presently practised, all producers receive the same price. The locational advantages under new freight rates could be significant relative to overall pooled prices; therefore, the redistributive impacts of pooling on revenue and production could be considerable. In particular, Alberta is suited to barley production, and regional pooling would likely produce a significantly higher net on-farm barley price in Alberta, and consequent increased barley production in Alberta.

The last pooling change suggested here is similar to the above, and relates to protein grading of wheat. The single, small premium now paid for high protein wheat appears to serve only to attract some producers that already have their wheat in the bin, to identify and deliver the two categories of wheat. It is doubtful that a producer would rationally attempt to produce the higher protein wheat at the existing, small premium. However, the CWB offers several protein categories for sale, and the price differences are substantial. If the different protein levels command their own prices in the market, those different prices reflected back to producers may elicit management response to make better use of varieties, fertilizer and the land resource to produce the protein level demanded by international buyers. There is no financial incentive to do that now. Unless adding protein categories would add more cost than value, such a change should be considered.

The final observation relating to CWB operation is the need for improved market signals to farmers. It encompasses elements of the quota system, revenue pooling, initial, interim and final payments, and the Board's sales strategy. Presumably the arguments that improved production decisions flow from improved market information do not have to be established here. Most (and the important) decisions on production in the

Prairie grain economy are private decisions made by thousands of individual producers prior to spring planting. Those decisions lock the producer into a sequence of events and output until the following spring. Considered in aggregate, these decisions significantly determine the pattern of sales for the CWB, the financial health of input suppliers, and over time, the health of the farm economy. They are, therefore, important decisions; they require the best and fullest information available. This places particular responsibilities on the marketing system and the largest player in the marketing system to perform the tasks of collating, processing and conveying information in the most effective manner possible.

As indicated throughout this report, information flows, particularly from the CWB, are lacking. There is no suggestion here that this is an easy task--for government information sources, the CWB, private traders, or for farmers. It is recognized to be one of the most difficult and hazardous of all economic functions. Moreover, real information release and forecasting is especially hazardous for an agency which is in a position to alter market results simply by indicating what it expects might occur. However, if the process of information collection and processing is difficult for agencies and private traders with their specialized resources and expertise, it is unmanageable for the individual producers who ultimately make the decisions and bear the financial responsibility of their decisions. Prairie farmers have learned to live with poor information--they measure tomorrow by today, and they produce today what they produced yesterday. If the Prairies are to outperform the past and capture the opportunities that are available, the information flow to farmers, particularly from the CWB, will have to be improved. An important first step was taken in 1970 with the introduction of an annual release of a

ministerial circular prior to seeding, and the holding of producer meetings in February and March. However, much more information release is required.

The Canadian Grain Commission. The CGC is the other major regulator in the western grains industry. The activities which appear to be most important in terms of this study are (1) the administration of export standards on Canadian grain, (2) regulation of handling tariffs and other handling practises by elevators and terminals, and (3) administration of producer-loaded cars. As in the preceding discussion of the CWB, the CGC has a key role in the structure of the grain industry. The objective of this summary is to draw attention to potential significant structural rigidities which may impede productivity directly, or by impeding competitive forces, result in reduced productivity and resource distortions.

In administering Canada's export standards, two concerns were developed in this study--the restrictions on licensing of new varieties, and the tolerances for foreign matter on export grains. In both cases, there is little doubt that productivity is reduced--total grain output in the case of varieties licensing, and terminal throughput in the case of allowable dockage. The real issue is, however, whether the existing regulatory framework accomplishes, at minimum cost, what is required in the export market--that is, whether the existing system is efficient. It is our suggestion that this is not likely the case, and there is a considerable body of opinion to support this view. Alternatively, the CGC holds that the existing regulations are essential to maintaining Canada's place in world trade. The importance and economic significance of this difference in positions cannot be overemphasized; it is fundamental to Canada's future development in the world grain trade, and to the domestic

situation as well.[2] It is an area which should be capable of reasonably objective economic analysis, but this has not been done comprehensively by those favoring relaxation of the regulations. Neither does available published material indicate that the CGC or Agriculture Canada have produced information to perpetuate export standards in their historic form. If changes in these regulations are unwarranted, they should be shown to be so by credible research information. Without such information, the belief will remain that the associated productivity losses are real.

The role of the CGC in administering handling tariffs and producer loaded cars are a component of regulation which has important competition implications. It was argued that the handling tariff structure facilitates the process of reducing price competition in grain handling and may thus protect the existing infrastructure and that the handling system is slow to evolve and as a result likely does not minimize handling costs experienced by producers. It was argued that producer-loaded cars could be (are) a form of competition to the existing country handling system. Facilitating this form of competition is partly within the authority of the CGC and should be encouraged.

Domestic Feed Grain Policy. This is the important policy link between livestock production in Canada and the western grains sector. As such, it has to accomplish a large measure of compatibility between the two markets while minimizing the extent of market or production distortions in each sector. The basic change in feed grain policy in 1973, to open up this market, has resulted in a number of benefits for both sectors. The

problems that remain can be characterized generally as overregulation of specific aspects of the feed grain market; in particular, the difficulty, or inability of domestic feed grain prices to be arbitraged with international prices. Consequently, the regulation in this component of the domestic grain market also produces false market signals which spill over into the livestock sector.

Resolution of these conditions would require several changes. The simplest way to improve the arbitrage process is to open up feed grain exports to private traders, and allow free access by domestic livestock producers to U.S. corn and other feed grains. This latter step would require reducing the corn import tariff and removing import permit requirements from feed grains. It is difficult to understand why U.S. corn or barley should not be allowed freely into Canada to replace Canadian barley which can at times be exported at a higher net return to farmers.

The Corn Competitive Formulae are the other components of feed grain policy that require change. When the CWB makes significant sales at these prices, that volume of western grain involved is generally underpriced. This situation has occurred at least twice. The CCF essentially places upper limits on domestic barley prices. For western Canadian barley producers there are no offsets; it is a one-sided bargain that perpetuates the East-West tensions in the grain market. From an economic standpoint, it is an important market distortion and an implicit producer-to-user (West-to-East) subsidy without an explicit rationale.

Originally, an important concern underlying the Domestic Feed Grain Policy was the security of supply of feed for Eastern livestock producers. This situation also has changed significantly since 1973. Eastern Canadian feed production has increased rapidly, and as the Canada Grains Council has

indicated, over the next decade will likely replace Prairie barley in Eastern markets. In addition, removal of feed grain quotas, import permits on U.S. barley, and reducing the tariff on corn would assure supplies from a wider area for Eastern feeders. Under the circumstances which are evolving, supply security of livestock feed should be relevant only in the national context, and in the context of protecting the entire livestock sector when stocks are expected to be unacceptably low. This aspect of "stabilizing" the livestock sector does not yet appear to have been incorporated into policy formulation; it would appear to have much greater economic rationale than assuring supplies for a particular region by means which produce significant national market distortions.

Canadian trade policy in grains. Grains have been, and will continue to be, significant foreign exchange earners for Canada. Canada's role in the international grain trade in the remainder of this decade will not be threatened even if there are no major changes in trade policy. However, to improve Canada's performance in international markets will require very aggressive trade measures and departures from past policies. An important aspect of the international trade side of Canada's grain sector which became more and more apparent as this study progressed is the absence of available information on trade prospects from domestic sources.

The public information from the Canadian Wheat Board on Canada's production potential and market opportunities which was first released in late 1980 was little more than trend forecasts. The Canada Grains Council studies provide useful detailed and public information on domestic relationships, but they fail to consider international market factors. Within the resources available for this study, our methodology could go no further than to review and compare available sources of information on

international prospects and all of these were external sources. In an industry as large and important as Canadian grains, and with the international component so important to the Canadian industry, depending on external information sources is inadequate. Other sources will not, for example, determine if Canadians should maintain the emphasis on quality for the export market, or whether it is time to relax certain quality standards in search of increased productivity and production.

It is possible that considerable analysis is undertaken and that information is available within part of the public decision-making framework, but that this information is not publicly available. Certainly, it is a conclusion of this study that more and better information is required throughout the grains industry, and specifically on the international side. There appears to be a real need to establish some priority for research, analysis and reporting of grain industry problems including, but not restricted to, international markets and trade. There is presently very limited funding available to analysts outside the grain industry, and with the exception of the Canada Grains Council, the analysis does not appear to have been generated within the industry.

Interestingly, there is a ready-made source of funding available to the Prairie grain industry. With the termination of the Prairie Farm Assistance Act in the early 1970's, a large sum of accumulated PFAA funds (farmer and federal contributions) became surplus, and has since been transferred to the Western Grain Research Foundation. This study has identified many important issues in the Prairie grain industry which could become research priorities for the fund.

The growing dependence on the Communist Bloc for Canadian grain exports is an area of trade policy which appears to require attention. Exports to these countries have allowed Canada to increase volumes at a

time when important traditional customers were switching sources of supply or meeting their own needs. But these new market outlets come with increased uncertainty, and no assurances of their long term potential. If longer term assurances on the commercial prospects for trade with Communist Bloc countries are not attainable, and if the existing policies of the EEC and Japan are maintained, Canada has little choice other than work hard to diversify markets into non-Communist countries. This will not be easy because the opportunities are limited. It will likely also require some diversification out of the conventional grains, especially the dependence on high quality wheat.

It appears essential as well that co-operation among grain exporters be improved and strengthened. This is particularly true of the two largest exporters of most grains--the U.S. and Canada. There is a long history in international grain markets of the importing countries benefiting at the cost of exporters because of the tendency of market conditions to be (long-run) supply driven. The past decade has certainly seen the EEC and Japan employ domestic policies to extract significant benefits for themselves which in a more open market would be captured by exporters. Exporter arrangements which seek to break down the barriers to international trade in grain, and reduce high internal prices in some countries, can be justified on global economic grounds. They would certainly help to improve Canada's trade and production prospects. If exporter co-operation were required for a time to take the form of a cartel arrangement in order to restore a more normal economic balance in production and trade, and if this is the most effective way to accomplish that goal, it would be in Canada's interest to promote this approach.

In support of each of the above suggestions for improving Canada's performance in trade, there may be an opportunity for the upgrading of market development, promotion and sales effort in all the grains. It is difficult to assess the extent or quality of market development and sales effort in the major component of international sales, those made by the CWB, because the information is not available. Nor can we document shortcomings in the market development and sales effort directed towards oilseeds and other special crops. However, there is the belief in some circles that federal representatives in trade services overseas tend to be generalists, without adequate knowledge about each agricultural commodity, and that the periodic missions are too sporadic. Passage of the legislation to establish Canagrex presumably reflects the perceived need to enhance our ability to market agricultural products abroad. Our view is that private and commodity group interests should be encouraged to become involved in market development and promotion activities in foreign countries. There has been only a fragmentary effort at these activities by Canadians, but the U.S. appears to have had considerable success in a number of commodities, particularly soybeans. Greater openness of CWB efforts, and direct participation by producer interests may also serve to improve performance in traditional grain exports.

Work Stoppages. Among the several other requirements indicated for Canada to achieve its grains potential in this study, labour-management relations and work stoppages rank as important issues. Sales have been deferred because of grain handling, transportation or inspection shutdowns, third-party costs arise, and continuous disputes and stoppages tarnish Canada's reputation as a reliable exporter. Continuous and maximum throughput of the entire grain industry is one of the essential ingredients

for Canada maintaining its competitive position. Moreover, as port and terminal capacity become more constraining at larger export volumes, it is essential that their throughput be maintained.

The labour-management problems that have been experienced in the Canadian grain handling and transportation system are more characteristics of a national problem than they are of the grains sector. Consequently, their resolution has to be sought in the wider context of national solutions. However, the nature of grain handling and transportation with its many potential bottlenecks after the grain has left the farm means that a disagreement between a small group of employees and a small group, or single employer, can influence tens of thousands of farmers, thousands of other labourers and employers, hundreds of communities, and in the end, reduce grain sales. This is the crux of this issue and deserves careful attention by all components of the grains industry and governments if tensions are to be reduced and greater output achieved.

The land resource. Canada has an important renewable resource in its Prairie cropland. There remain some opportunities to increase crop production by use of new land, but these opportunities are overshadowed by those associated with better use of existing land. Important among the ways to increase production from existing land are less summerfallowing and more continuous cropping, and better use of purchased inputs. Despite the rapid rate of technological adaptation by farmers, there remain significant opportunities for improved use of fertilizers, herbicides, new varieties, quality seed and efficient tillage practises. Some of these opportunities exist within the current body of technical knowledge, and others will arise as new knowledge becomes available. On the one hand then, capturing these opportunities is the (continuous) process of generating technological im-

provements--this comes from research. Public efforts at agricultural research in Canada appear to have had a high pay-off; private research efforts generally have been small and ways need to be found to increase and improve them. On the other hand, capturing the opportunities is also the process of having grain farmers adopt research output. This requires extension and demonstration. But it also requires a market environment which provides the incentive to change, to assume risks, to attempt to maximize in an uncertain world. An important part of the market facing Canadian grain farmers is the international component about which Canadians can do very little, except to cushion some of the impacts of rapid and unexpected change, and to maximize sales effort. However, an important part of the market environment is that domestic component in which market signals are transferred, individual marketing and production patterns are determined, varieties are licensed and so on as identified throughout this report.

There appears to be agreement among many experts that we have the technical expertise now to preserve the Prairie land resource. There appears also to be growing concensus on the major economic and regulatory constraints to increasing production on the Prairies.

Consequently, the environment exists for making the required changes; the task is to seize the opportunities.

FOOTNOTES

[1] The corporate structure of the Board also appears to be a holdover from previous days when conditions were less complex. Unless the federal cabinet is considered to be the equivalent of the Board of Directors, the executive and senior management levels of the CWB are the same individuals, five Commissioners. In addition to their policy and senior management roles, the Commissioners also actually sell grain. Although this structure may have limited precedent in Crown Corporations, it is doubtful that anything close to it exists in the commercial sector, especially within organizations whose gross sales run into the billions of dollars, and range around the world.

[2] In this context, it is observed that the 1982 Canadian wheat crop was of poor quality because of early frost. Over 20 percent of the crop graded Canada Feed (normally only two to three percent) and only 25 percent graded No. 1 CWRS (normally over 50 percent). Despite the low quality crop, 1982/83 crop year sales were a record, and the wheat pools apparently showed a surplus.

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